THE AUTOMOBILE

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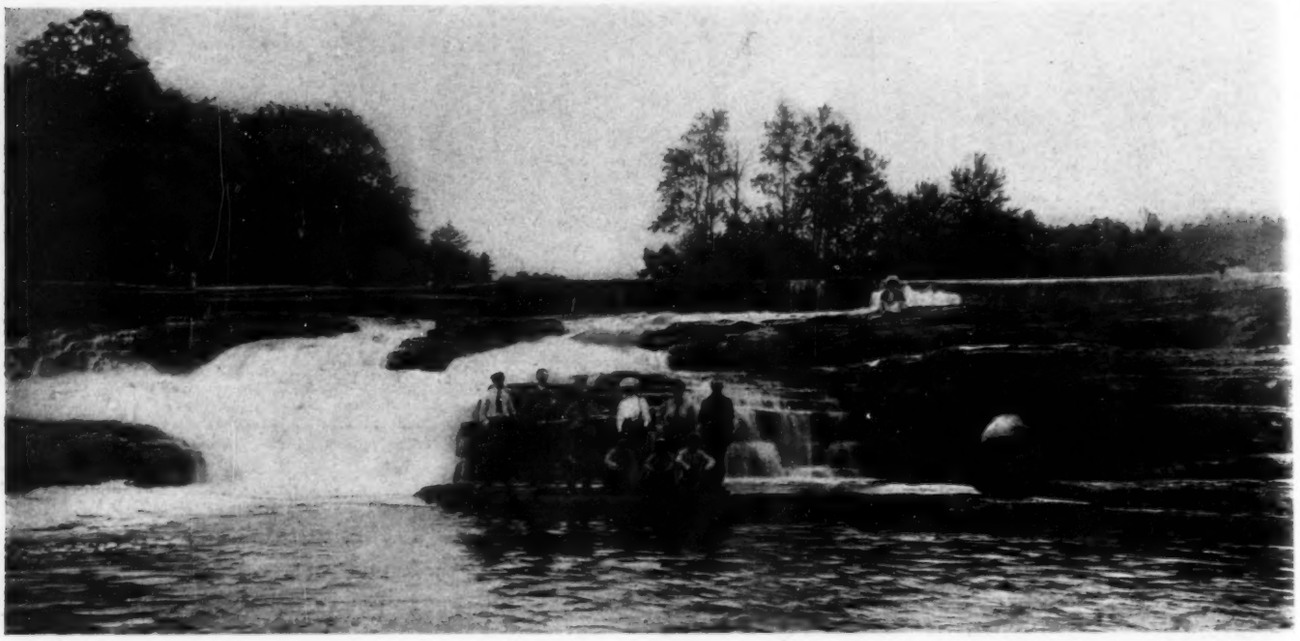
# A TOUR THAT IS TESTING THE AUTO

## Journey of Over a Thousand Miles Proving the Worth of Motor-Driven Vehicles and Emphasizing the Value of Good Roads

BY A. G. BATCHELDER.

QUEBEC, July 24.—Across the placid St. Lawrence the sturdy ferry-boats are now conveying to Levis the automobile cavalcade which is about to make its plunge down into the Maine wilderness. Traveling with Secretary S. S. Gorham in a free-lance Winton, not subject to checking station regulations, we are at liberty to extract full and leisurely enjoyment from this Third Annual Tour of the A. A. A.—a tour that is accumulating conclusive evidence of the worth of the American automobile, for now no car of foreign manufacture with a perfect score remains in the contest for the Glidden trophy. It should be said right here, however, that the manner in which S. B. Stevens received discredit points was by an exasperating miscalculation of time, which

F J. PARDEE IN HIS PACKARD, GOING UP GRADE AND THROUGH HUB-DEEP SAND NEAR THREE RIVERS, QUEBEC.

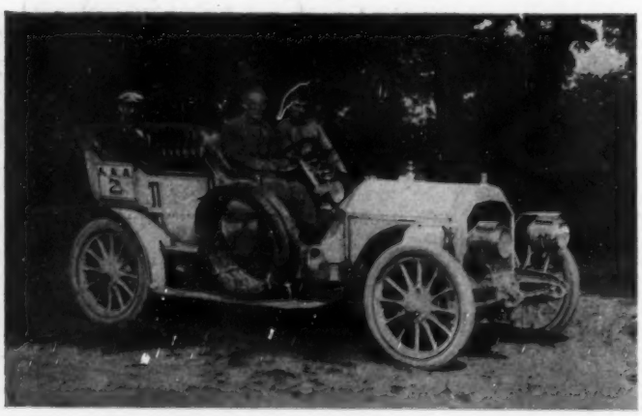


GLIDDEN TOURISTS AT AUSABLE CHASM—EZRA KIRK, MRS. KIRK, MRS. BENJAMIN, C. ARTHUR BENJAMIN, AT RIGHT OF GROUP.

brought his Darracq at a checking point five minutes too early. The reception which the tourists have received in the province of Quebec has been gratifying and of exceeding warmth; both in Montreal and Quebec the efforts to entertain were successful and appreciated. The Mayor of each city gave personal greeting to the travelers from across the border, and the flag-waving, flower-strewn route will be remembered in the days to come. Mayhap if the inhabitants of Quebec had us too long, and some of the unruly broke loose in incautious driving, the popularity of the moment would yield quickly to a tide of disapproval—as it does in our own country when the bad ones disregard the rights of the other users of the highway.

But we are ready and willing at 6 o'clock this bright morning to be conveyed over the broad stream, take our last look at the picturesque old city with its frowning fortress, and turn southward. Ninety-four miles will bring us to the boundary line, fifteen miles beyond which is Jackman, the Maine town where we shall camp out for the night.

Of the 1,144 miles from Buffalo to Bretton Woods, 714 miles had been traversed when the tour reached Quebec. Only 430 miles now remain to be covered before we shall be comfortably located in the shadow of the Presidential Range, and then will come the summing up of the results and the deductions of those who feel qualified to express their opinions on this greatest of tours, containing much that is good and betraying faults susceptible of erasure on the next occasion.



ARTHUR HOLDEN, OF CLEVELAND, IN HIS STEARNS.

The checking points will become more frequent from now to the conclusion, and the margin for repairs on the road will shrink perceptibly. The nineteen tied in the Glidden struggle may be eliminated, one by one, until a solitary claimant stands out alone; and then, again, a round dozen or more may confront Chairman Deming and his associates. The automobile of to-day is capable of undergoing a strenuous experience, and its enduring qualities easily exceed the demands of any ordinary competition yet devised.

### Mr. Glidden's Quebec View of the Tour.

This is the view of Mr. Glidden, as expressed to me this morning just before the globe-girdler left in the White steamer of ex-Chairman Augustus Post, with whom he is riding:

"The A. A. A. tour has progressed far enough to enable the prediction that it will be a grand success to the finish and the greatest event of its character in the automobile world. The main object of the tour in reaching points of interest without too great a consideration for roads has been attained, for the valleys of the Mohawk and St. Lawrence and the mountainous districts of New York can be classed with the best of American scenery accessible to the automobile. The roads, while rough in many places, are no worse than one would encounter on a tour of the world. The checking system has worked admirably, and with some slight changes a model tour can be conducted. One must learn from experience; the committee will have sufficient data to be of valuable service in future contests of this kind.

"A professional tourist guide, to book the travelers and place the heavy baggage in their rooms before arrival, would have aided the committee and saved considerable annoyance to members of the party. This is a minor detail that can be remedied in the future. The committee, I should like to say, is deserving of great credit for its untiring efforts in behalf of the tourists. I have in mind a few suggestions that I would like to make on the completion of the tour at Bretton Woods, which I believe will assist in organizing an ideal tour for 1907."

### Percy Pierce Thinks the Tour No Hardship.

The 1905 winner of the tour, Percy P. Pierce, is pursuing the even and uneven tenor of his automobiling way in his customary nonchalant manner. The enforced rests are not thoroughly to his liking, and he would prefer to be at it every day without any hesitation, resting up only when the task is actually over. In this idea he has many who agree, for there are not a few who think

the total number of days amounted to just about a week too much. "Perhaps because I am used to driving on all sorts of roads," remarked the representative of the Automobile Club of Buffalo, "this route for the 1906 tour does not seem to me particularly trying, and the schedule has been easy for my Great Arrow. In the Herkomer tour the model highways of Germany and Austria made driving comparatively easy, and, barring the heavy grades, that event was not as difficult by many degrees as this American route. I wish that some of our European friends were over here for the Glidden contest. I should like to have them try our varied roads."

## FROM MONTREAL TO THREE RIVERS.

THREE RIVERS, QUE., July 20.—'Twas a welcome rest that the tourists had in Montreal on Thursday, and the goodly people of the city were the best of hosts, the Mayor setting an example generally followed. The local automobile club added materially to the enjoyment of the visitors, one feature of their entertaining being a trip through the Lachine Rapids, during which some of the autoists were more apprehensive than when bounding and bumping over strange and uncertain roads.

Thursday had an overcast sky, which weakened the rays of Old Sol, and the 96-mile ride could have been more trying by many degrees. For pleasure touring the going could not have been rated satisfactory by stretching one's imagination to the limit, but, as Secretary Gorham expressed it, the journey from Buffalo had changed the automobilist's idea of roads. A bad road had become a highway over which the automobile could not go; therefore, if we progressed over the main Canadian route, it must be considered not a bad road.

Notre Dame street supplied a mangled thoroughfare as a means of exit from Montreal, it being in the hands of the road-menders. Then, in the country, came miles of shifting sand, which tried the strength of the engines and the patience of the drivers. John L. Snow, whose Peerless had a clear score, took an abrupt turn too quickly and plunged through a fence, the result being a damaged steering gear that delayed him several hours. This reduced the Glidden contestants to a round score.

If the roads grudgingly accepted the passage of the automobiles the sentiment was not shared in by the inhabitants along the road, for they waved flags, tossed fruit and flowers into the tonneaus, and the mischievous misses threw kisses that were returned at record speed.

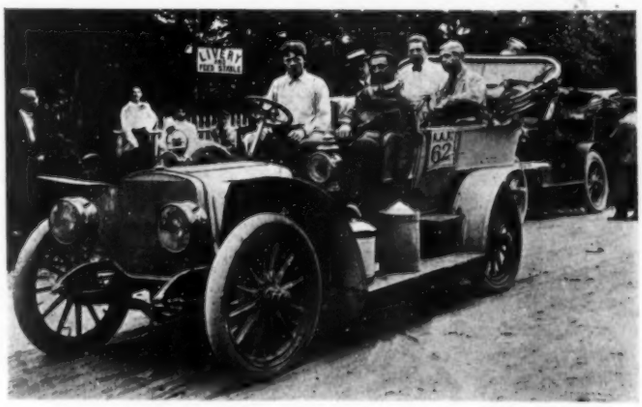
Of the flags that were waved the tri-color of France figured the most prominently, and the stars and stripes floated from many masts and were exultingly shaken by the excited onlookers, whose *bon voyage* shouts followed the struggling cavalcade into town and out of town during the whole day. The emblem of Britain was only occasionally in favor, and one, judging by flags and language, would have believed himself in a province of France and not in a part of King Edward's realm. Banners were stretched across the road, and in one town the village priest laboriously emitted "Yankee Doodle" from a cornet that had seen much service.

Three Rivers being somewhat deficient in hotel accommodations, a river steamer supplied sleeping room that cost $3.50 per stateroom. An extra contribution brought about a ride on the St. Lawrence that was cooling and refreshing. Volunteer musicians were plentiful, and the evening was pleasantly spent.

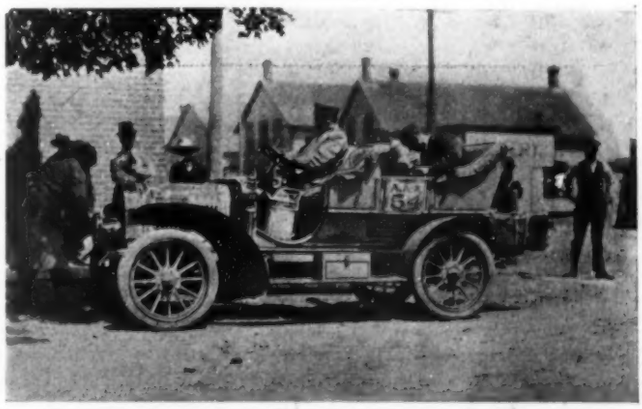
## FROM THREE RIVERS TO QUEBEC.

QUEBEC, July 21.—Another overcast sky which threatened rain and did not yield a shower made the morning exit from Three Rivers comfortable. The sandy road was trying and rutty, but it improved as the day wore on, developing into first-class highway in the concluding miles of the 98-mile trip, during which No. 41, I. C. Kirkham's Maxwell, snapped a spring and suffered a delay that took it out of the clean score brigade. This left nineteen candidates tied for trophy honors.

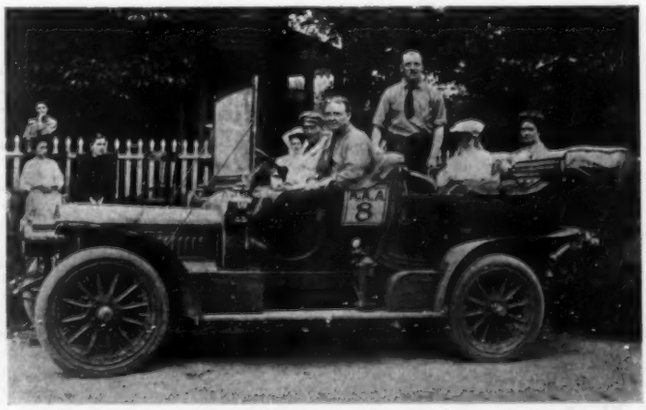
SOME STOPPED AT THE LOZIER WORKS, PLATTSBURG, FOR FUEL.



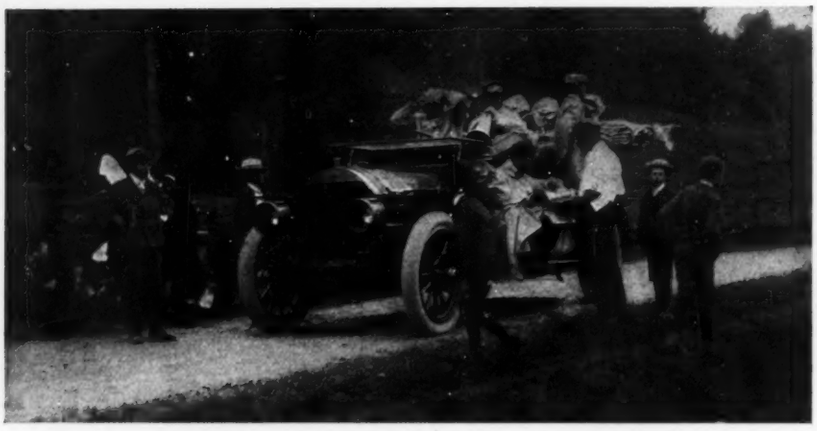
E. R. LOZIER IN THE FINE 40-H.P. THAT BEARS HIS NAME.



W. L. DAVIS READY TO TACKLE THE SAND IN HIS POPE-HARTFORD



EZRA KIRK IN HIS 50-H.P. THOMAS FLYER.



SIX-CYLINDER PIERCE PICKING UP THE CHECKERS.

This day there were hills that required substantial horsepower for their surmounting, one called Cap Sauté being a stickler that evoked intermittent bursts of cussing.

As on the previous day, the demonstrations of the kindly folk were continuous and hearty. Traveling with Secretary Gorham in his non-contesting Winton, we were able to use our pleasure in halting at checking stations. At the second halting place, Portneuf, we enjoyed a second breakfast, the early one at Three Rivers having been only such in name. After having gorged ourselves at the little *pension* and asking for our bill we were dumfounded with the reasonable charge of 25 cents each. This was so at variance with our previous overcharges for lodging and refreshments that we thanked the motherly proprietor and insisted upon her accepting more than she asked.

A grand view rewarded the long grade to St. Foy, only ten miles from Quebec, and at the same time the road improved with a jump. The Mayor welcomed, in company with local automobilists, the tourists as they checked at the St. Louis Gate, and then it was a sprint down St. Louis street to the luxurious Château Frontenac, where, unfortunately, all could not be housed, the summer season being in full blast hereabouts.

## FROM QUEBEC TO JACKMAN, ME.

JACKMAN, ME., July 24.—Fair skies overhead and somewhat muddy roads beneath, which were, however, on the average better than on any previous day's traveling, marked the trip from Quebec to this point. The route lay through a glorious country and led by degrees into the boundary range of hills that marks the dividing line between the United States and Canada. The day was cool and when the mountain region was reached coats were put on. The effusive reception of the natives continued as long as the French section of Quebec province was traversed and then it ceased abruptly. The girls tossed bouquets, cookies, candies and billet doux into the cars, and in two places men handed out bottles of ale.

It was very pleasant for those who had no trouble with their cars, but it was a trying day for the contestants. The hills and bumps called for high powered and strongly built cars. Showers that fell last night left the road wet and in places very muddy. On one muddy hill near St. Clune, seventy-three miles out, all except a few of the best cars had trouble, many being stalled and some requiring hand power to help them up. The mud prevented sufficient traction, and the grade was about as bad as any encountered since the big one near Amsterdam, over which the tourists were led by mistake the second day out.

To-night the list of contestants for both the Glidden and Deming trophies has been reduced and several cars added to the list of pleasure tourists. Also the list of those who had clean scores has been reduced.

For this elimination the new system of checking shares the blame with the hills and bumps. It was intended that the extra checkers should cause some elimination by preventing the cars from racing to controls and compelling them to keep a more even pace. There were seven controls to-day instead of only two or three, and all of the checkers are not in yet. Some are apt to be late, as the car that was to pick two of them up was having some trouble when last seen on the road. No official score can be made up till all the checkers are on hand with their records, but it is known that the following have fallen from the perfect list in the Glidden contest: Arthur Holden, Stearns; L. J. Petre, Stearns; Palmer Abbott, Oldsmobile, and H. K. Sheridan, White. Those who have ceased to-day to be perfect in scoring for the Deming trophy are J. G. Cassatt, White, and Watson Coleman, White. This leaves only Augustus Post, White, and C. W. Kelsey, Maxwell, Tarrytown.

The mishaps to-day included several broken springs and axles. The big baggage truck and the Clément Bayard of E. M. Wiley were ditched about five miles from the ferry at Point Levis, to which place the cars crossed from Quebec by boat. Among others who suffered were Sydney Gorham, secretary of the A. A. A., who broke springs of his Winton, and George Otis Draper, who had a similar accident with his Packard. Theodore Shultz, Marmon, broke a front axle.

Jackman assumed the aspect of a tented field to-night. It was impossible to obtain accommodations here for all the tourists at the hotels, and the committee arranged for fifty tents, in which the majority of the tourists are being accommodated.

"LA PRESSE" CAR GREETING TOURISTS AT VICTORIA BRIDGE.

## JACKMAN TO WATERVILLE.

WATERVILLE, ME., July 25.—To-day's ride from Jackman was a superb one, through wild, picturesque country. An early start was made, and as the route was by the outlet of Moosehead Lake, and down the ever-varying valley of the Kennebec river, a more delightful day's journey can hardly be imagined. Any bad humor that the "tent-dwellers" at Jackman may have felt quickly wore off in the snappy, invigorating, pine-laden atmosphere that was doubly charged with health and good humor. Ninety-three miles is the sum total of to-day's trip, and every foot of it was replete with points of interest. At a late hour to-night the committee had not announced the score changes, and they will probably be few.

T. P. C. FORBES IN REO AT MONTREAL CONTROL.

ONE OF CANADA'S TYPICAL HIGHWAYS.

## GLIDDEN TROPHY SCORES AT JACKMAN, ME.

| | | |
|---|---|---|
| No. 1. | Apperson, 40-45 h.p., N. H. Van Sicklen, Chicago A. C. | 0 |
| No. 8. | Thomas, 50 h.p., Ezra E. Kirk, A. C. of Buffalo..... | 0 |
| No. 9. | Thomas, 50 h.p., George M. Davis, A. C. of Buffalo.... | 0 |
| No. 11. | Pope-Toledo, 35-40 h.p., George Soules, Toledo, O..... | 0 |
| No. 12. | Pope-Hartford, 25 h.p., Wilbur C. Walker, Hartford... | 0 |
| No. 14. | Pierce Arrow, 32 h.p., Philip S. Flinn, Pittsburg, Pa... | 0 |
| No. 15. | Knox, 35-40 h.p., William E. Wright, Springfield A. C. | 0 |
| No. 25. | Columbia, 24-28 h.p., Chas. F. Barrett, A. C. of Hartford | 0 |
| No. 27. | Pierce, 40-45 h.p., Percy Pierce, A. C. of Buffalo..... | 0 |
| No. 28. | Pierce, 40-45 h.p., A. E. Hughes, Rhode Island A. C... | 0 |
| No. 51. | Oldsmobile, 28-30 h.p., Ernest Keeler, Lansing, Mich... | 0 |
| No. 53. | Cleveland, 30-35 h.p., Dexter Fairbanks, Cleveland A. C. | 0 |
| No. 56. | Peerless, 45 h.p., Charles Burnham, Cleveland A. C..... | 0 |
| No. 66. | Marmon, 30 h.p., Frank E. Wing, Bay State A. A..... | 0 |
| No. 73. | Packard, 24 h.p., Gus G. Buse, Buffalo, N.Y..... | 0 |
| No. 52. | Oldsmobile, 28-30 h.p., R. R. Owen, Cleveland A. C..... | 1 |
| No. 2. | Stearns, 40-45 h.p., Arthur Holden, Cleveland, O..... | 2 |
| No. 63. | Elmore, 35 h.p., J. H. Becker, Cleveland A. C..... | 2 |
| No. 3. | Stearns, 40-45 h.p., L. J. Petre, Cleveland, O..... | 3 |
| No. 36. | Columbia, 40-45 h.p., W. W. Burke, New York M. C... | 3 |
| No. 61. | Reo, 16 h.p., T. P. C. Forbes, New York Motor Club.. | 3 |
| No. 70. | Oldsmobile, 28-30 h.p., Palmer Abbott, New Orleans, La. | 4 |
| No. 67. | White, 18 h.p., H. K. Sheridan, Cleveland..... | 5 |
| No. 62. | Lozier, 40 h.p., E. R. Lozier, New York, N. Y..... | 6 |
| No. 55. | Crawford, 24-28 h.p., W. A. Danzer, Hagerstown A. C. | 7 |
| No. 50. | Corbin, 24 h.p., Maxwell S. Hart, New Britain A. C.... | 9 |
| No. 58. | Darracq, 40-60 h.p., S. B. Stevens, A. C. of America.. | 14 |
| No. 26. | Packard, 24 h.p., Frederick J. Pardee, Chicago A. C... | 17 |
| No. 59. | Oldsmobile, 28-30 h.p., John Banford, Lansing, Mich.... | 21 |
| No. 5. | Stoddard-Dayton, 30-35 h.p., J. H. McDuffee, Chicago | 26 |
| No. 41. | Maxwell, 16 h.p., I. C. Kirkham, New York City..... | 30 |
| No. 65. | Marmon, 30 h.p., T. E. Schulz, New York Motor Club.. | 36 |
| No. 16. | Stevens-Duryea, 50 h.p., R. B. Craufurd, New York.... | 87 |
| No. 69. | Locomobile, 30-35 h.p., B. H. Knowles, Brooklyn, N. Y.. | 99 |
| No. 37. | Peerless, 30 h.p., C. G. Wridgeway, A. C. of America.... | 136 |
| No. 38. | Lozier, 40 h.p., A. L. Rich, New York Motor Club..... | 234 |
| No. 60. | Corbin, 24 h.p., Philip Corbin, Jr., New Britain A. C.... | 291 |
| No. 23. | Pope-Hartford, 20-24 h.p., Jos. A. Mechaley, Stamford.. | 369 |
| No. 20. | Clément-Bayard, 24 h.p., E. M. Wiley, New York City. | 1706 |

### The Score for the Deming Trophy.

| | | |
|---|---|---|
| No. 24. | Maxwell, 36 h.p., C. W. Kelsey, New York M. C..... | 0 |
| No. 31. | White, 18 h.p., Augustus Post, A. C. of America..... | 0 |
| No. 40. | White, 18 h.p., J. G. Cassatt, A. A. A..... | 88 |
| No. 33. | White, 18 h.p., Watson Coleman, Bay State A. A..... | 151 |
| No. 43. | Peerless, 30 h.p, F. H. Peitsch, Chicago A. C..... | 429 |

### Present List of Non-Contestants With Tour.

No. 7. Packard, 24-h.p., G. O. Draper, Massachusetts A. C.
No. 18. Packard, 24 h.p., Hart D. Newman, New Orleans A. C.
No. 22. White, 18 h.p., Paul H. Deming, A. C. of Detroit.
No. 32. Packard, 24 h.p., B. W. Reichert, N. Y. M. C.
No. 39. White, 15 h.p., L. F. Braine, N. Y. M. C.
No. 45. English Daimler, 30 h.p., Thomas F. Moore, N. Y. M. C.
No. 48. Cleveland car, 30-35 h.p., James Laughlin, Berkshire A. C.
No. 49. Stevens-Duryea, 20 h.p., Charles L. Auger, A. C. of America.
No. 54. Pope-Hartford, 20-25 h.p., W. L. Davis, A. A. A.
No. 72. Pierce Great Arrow, 60 h.p., A. N. Jervis, A. A. A.
No. 81. Oldsmobile, 28-30 h.p., R. B. Hamilton, St. Catharines, Ont.
No. 82. White, 18 h.p., E. T. Fitch, N. Y. M. C.
No. 83. Mercedes, 40 h.p., A. H. Rutherford, New York City.
No. 84. Pope-Toledo, 45-h.p., J. W. Morrison, Bay State A. A., Boston.

### Those That Have Retired from the Tour.

No. 6. Silent Knight, 30-40 h.p., C. Y. Knight, A. A. A. Dropped out on first day.

No. 19. White, 18 h.p., Webb Jay, Chicago A. C. Met with accident, car catching fire while taking on gasoline. Dropped out on first day.

No. 21. Haynes, 50 h.p., Elwood Haynes, Chicago A. C. Dropped out at Elizabethtown, N. Y.

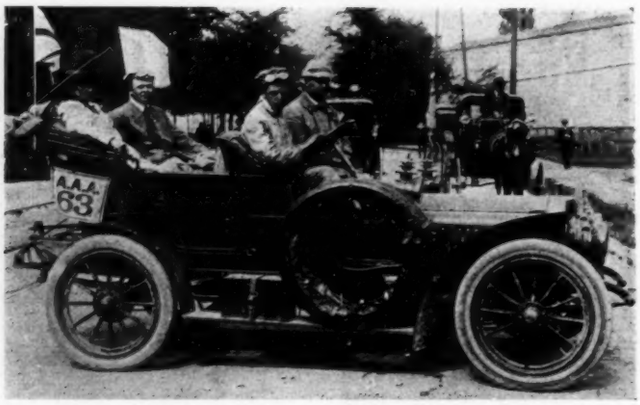
No. 29. Buick, 30 h.p., H. E. Shiland, A. A. A. Dropped out on first day.

No. 30. Buick, 22 h.p., W. C. Durant, Jackson, Mich. Dropped out at Lake Champlain.

S B. STEVENS, DARRACQ, CHECKING AT THREE RIVERS.

ONE OF THE MANY SHRINES PASSED EN ROUTE.

R. B. CRAUFURD, SIX-CYLINDER STEVENS DURYEA, CHECKING.




J. H. BECKER IN ELMORE AT QUEBEC.

No. 34. Gearless, 50 h.p., J. W. Breyfogle, Rochester A. C. Dropped out on first day.
No. 44. Packard, 28 h.p., George W. Beach, Hartford A. C. Dropped out at Elizabethtown, N. Y.
No. 57. Harrison, 40 h.p., A. A. Russell, Grand Rapids A. C. Dropped out at Saratoga.
No. 64. Buick, 30-35 h.p., W. L. Marr, Jackson, Mich. Dropped out at Lake Champlain.
No. 71. Cadillac, 10 h.p., Zalman Pennock, Elmhurst, L. I. Dropped out at Lake Champlain.

### These Were Canceled at Buffalo and Did Not Start.

No. 4. Napier, 24 h.p., Chas. J. Glidden, Massachusetts A. C.
No. 10. Thomas, 50 h.p., C. A. Coey, Chicago A. C.
No. 17. Pierce, 40-45 h.p., H. A. Paulman, Chicago A. C.
No. 35. Pierce, 28-32 h.p., C. Henry Fosgate, Chicago A. C.
No. 68. L. E. Myers, Chicago A. C.

### The Committee Cars.

No. 22. Paul H. Deming, 18-h.p. White, A. C. of Detroit.
No. 42. Sidney S. Gorham, 30-h.p. Winton, Chicago A. C.

### The Service Cars.

No. 76. Oldsmobile runabout, 6 h.p. "What's Wanted."
No. 77. Knox Automobile Company, Knox, Springfield, Mass.
No. 78. Olds Motor Works, 32-h.p. Oldsmobile, Lansing, Mich.
No. 79. Packard Motor Company, Packard car, Detroit, Mich.
No. 80. Maxwell-Briscoe Motor Company, 16-h.p. Maxwell.

### The Confetti Cars.

No. 13. Walter C. White, 18-h.p. White, Cleveland A. C.
No. 46. H. A. Grant, 10-h.p. Maxwell, Tarrytown, N. Y.

## TOURING COMMITTEE AND ITS STAFF.

The entire tour is in the hands of the Touring Committee of the A. A. A., assisted by other officials whom it has selected Herewith is the Touring Committee:

Chairman, Paul H. Deming, Automobile Club of Detroit.
Secretary, Sidney S. Gorham, Chicago Automobile Club.
C. L. Ainsworth, Automobile Club of Cincinnati.
George W. Beach, Automobile Club of Hartford.
James M. Boutwell, Automobile Club of Vermont.
Otto B. Cole, Massachusetts Automobile Club.
James B. Dill, Automobile Club of New Jersey.
George W. Ehrhart, Decatur Automobile Club.
Ezra H. Fitch, New York Motor Club.
F. C. Gates, Cleveland Automobile Club.
George A. Gould, Automobile Club of Davenport.
Capt. Homer W. Hedge, Automobile Club of America.
F. B. Hower, Buffalo Automobile Club.
Frank M. Joyce, Minneapolis Automobile Club.
J. C. Kerrison, Bay State Automobile Club.
Ernest J. Knabe, Jr., Automobile Club of Maryland.
Howard Martin, Albany Automobile Club.
L. E. Myers, Chicago Automobile Club.
August Post, Long Island Automobile Club.
Angus Sinclair, New Jersey Automobile and Motor Club.

The executive staff, which, under orders of the committee, will administer the details of the tour, is composed as follows: Superintendent, A. B. Tucker; Assistant Superintendent, E. L. Ferguson; Garage Chief, M. L. Reeves; Advance Agent, J. Schreyer; two assistants to the Garage Chief; a force of checkers, whose names will not be known until the opening of the Glidden contest; a baggage master and other assistants.

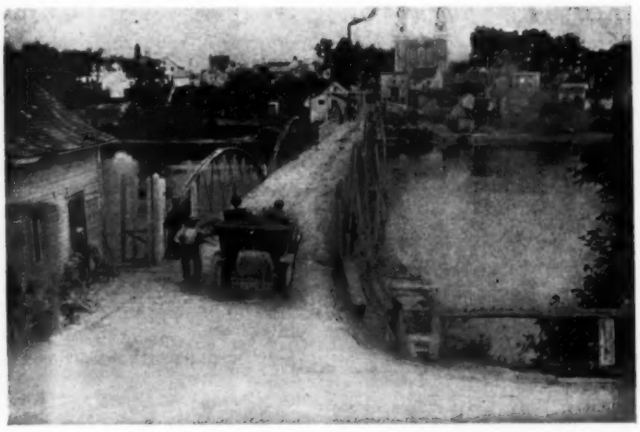
The committee figured the time for each day's run, between the controls, as follows:

| | |
|---|---|
| Buffalo to Auburn, 135 miles | 7 h. 52 min. |
| Auburn to Utica, 76 miles | 4 h. 20 min. |
| Utica to Saratoga, 95 miles | 5 h. 34 min. |
| Saratoga to Elizabethtown, 94 miles | 5 h. 54 min. |
| Elizabethtown to Lake Champlain, 38 miles | 3 h. 29 min. |
| (Including one hour's stop at Au Sable Chasm) | |
| Hotel Champlain to Montreal, | 5 h. 14 min. |
| Montreal to Three Rivers, 96 miles | 6 h. 53 min. |
| Three Rivers to Quebec, 98 miles | 6 h. 56 min. |
| Quebec to Jackman, 109 miles | 5 h. 46 min. |
| Jackman to Waterville, 93 miles | 6 h 34 min. |
| Waterville to Rangeley, 105 miles | 7 h. 16 min. |
| Rangeley to Bretton Woods, 124 miles | 8 h. 37 min. |

THE LITTLE MAXWELL CONFETTI CAR.

WILBUR C. WALKER IN HIS POPE-HARTFORD AT QUEBEC.

CANADIANS GREETING TOURISTS AT A CHECKING STATION.



TOLL BRIDGE AT ST. GENEVIEVE OVER BATISCAN RIVER.

# ODDS AND ENDS OF THE GREAT TOUR

THERE may be nothing in 13, but Walter White's pilot White was the only car ditched by loss of a wheel and his the only real serious looking accident.

When Quebec was reached the tour seemed almost over, but as the competitors looked forward to another week of the strain they protested against the hardness of it.

"I heard that the scenery was fine," said Charles G. Wridgway. Other drivers purchased guides to study up on the routes. Few drivers saw other than the roads when in competition.

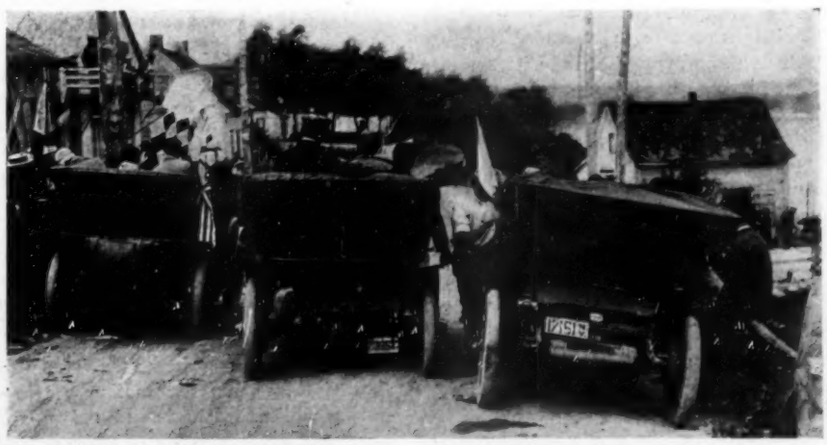
The report of a three-mile hill of soft sand outside Three Rivers worried more than the hotel bills. The bugaboo was 150 yards long and gave the high-powered cars little trouble.

Nelson Flannigan, chauffeur for Benjamin H. Knowles, deserted at Quebec after incompetent driving and poor work all through. Mr. Knowles will operate his own Locomobile and continue through.

John Eustis, of the *Globe*, got off a good one when he said: "They require each car to carry four, but I know of cars that carried but one. The other three were constantly in the air and could never be said to be passengers."

When W. W. Burke, the manager of the New York branch of the Electric Vehicle Company, was delayed by a burst tire, Mrs. Burke, who is with him on the tour, joined in the work of replacing it and the job was done in six minutes.

Joseph A. Mechaley, of Stamford, drew No. 23 and the skidoo figures haunted him. He got them everywhere, Canadian license, hotel room and so on, until the figures became a menace to the happiness of Mrs. Mechaley. "That '23' has pursued us far enough," said Mrs. Mechaley. "I believe it's worse than 13 and would take that number in preference on another tour if forced to take a number by the rules."



CONTESTANTS AWAITING THEIR TIME TO CROSS THE CONTROL.

The provisions of the Deming Trophy competition were so satisfactory that a score who entered for the Glidden contest would have preferred to change. Demingites were permitted the free use of three cars and repair work at any time was allowable.

The real amateurs who entered as such and then found that the makers had their best drivers operating cars, considered they had a kick coming. It may be that 1907 will see a run in two separate divisions, amateurs in one and purely trade in the other.

"No more superintending of tours for me," said Superintendent A. B. Tucker, Sunday, after a particularly hard hour of replying to kicks, yielding press information, and important conferences with the committeemen. "I'll be a plain passenger hereafter."

"Can you work and will you help us in time of need?" was the question put to every prospective passenger. Some who sought a cheap tour as passengers deserted the ranks when compelled to work their passage and securing passengers was a matter of some difficulty.

When the tour is over Tom Fetch will have piled up a wonderful record with Packard No. 79. Fetch takes the checkers over the course, returning to pick them up, a considerable run of over 250 miles on a 100-mile run. His tour mileage will be very close to 3,000 miles at the finish.

W. W. Taxis, in the Crawford, cracked a cylinder after leaving Montreal, but maintained his schedule on three cylinders right through Canada, running the hills nicely. It was the old-time plucky "Billy" who persevered and fought so game a battle. Others gave up the fight for less.

When toll-gate keepers raised prices from 15 cents to 50 cents the tourists lost patience. When one man refused American money from a competitor and then refused to change a $5 Canadian bill he was floored promptly and the car went on..

Those who spoke of the Glidden tour as easy, each day's run as a three hours' jaunt, and so on, might have heard a great many contrarywise reports Sunday night from a score of men who had failed and who were swearing off on such strenuous competition in the future. Men as well as cars have suffered.

Hart D. Newman, of New Orleans, who operates the big red Packard, is a genius. Mr. Newman's piano playing and his singing have kept the tired tourists happy night after night. Mr. Newman is a banker, street car magnate, and a Southerner of "before the war" times, very democratic and a good fellow.

It cost $11 to fill the Packard car, driven by Tom Fetch, with gasoline at 35 cents per gallon and oil at $2 per gallon, nearly double rates. The garage man in Quebec put on the charges and being afraid Tom had more endeavored to charge $1 for storage for the time the car was being filled. Then Tom rebelled and said things.

"Now we will go out for real touring," said one private individual who had entered his own Pope-Hartford, W. L. Davis. "Let the factory representatives abuse their cars if they want to. They can afford to put them out of commission. Thus far this tour has been a terrible strain alike to car and man, and I for one will be free."

The first tourists arriving in Three Rivers paid 20 cents for gasoline; later the price was raised to 25 cents, and then it "looked like thirty cents." Finally a price of 35 cents was reached and the tourists started their old familiar cry of "Going up." Everything else went up, as did Three Rivers' reputation as a robber's roost.

Twenty miles an hour seems easy when seen in figures, but he who operates a car day in and day out, up hill and down dale, through mud and through sand, at an average gait of twenty miles, is performing wonderful work. No record breaker between Chicago and New York ever succeeded in accomplishing the feat, and all set that average to try for.

Whoever gave the Dufresne Hotel at Three Rivers license to charge $4 per day and $1 for such meals deserves conviction as a Jesse James or "Bill" Dalton neither of whom could have possessed more nerve. The advance man will have to clear his skirts of the report of graft. Someone should have secured rates by contract and then forced the hotel men to live up to their agreements. Bagg's Hotel at Utica was a notable exception in this hotel overcharging.

Quebec's greeting to the tourists began on the arrival Saturday afternoon, when Mayor Garneau met the visitors as they entered the city. Later he called at the Chateau Frontenac in company with the Hon. R. Roy, the Provincial Secretary, and gave a formal welcome to Chairman Deming and his committeemen for them and all the participants in the tour. Monday at noon Chairman Deming, Globe-Girdler Glidden, Secretary Gorham, officials, and others returned the call of the Mayor, the Council Chamber being the scene of the reception. Short speeches were a natural sequence. In the afternoon came a boat ride on the St. Lawrence, and then a trolley ride to Montmorency Falls and the Kent House, where a luncheon and more speechmaking followed. General Henry, the American consul, was a prominent figure in this excursion, which was tendered by George E. Aymot, a prominent citizen and automobilist, who assisted materially in the entertainment of the visitors.

## CRAWFORD NOTCH HILL CLIMB.

Twenty-five entries, four more than competed in the White Mountain climb last year, are announced to date by Manager W. J. Morgan. The climb will be held July 30 on the mile and a half course through Crawford Notch, the grade of which averages 15 per cent.

## A MONSTER EUROPEAN TOUR.

Paris, July 17.—The 4,000 kilometer European Circuit being dead, an enterprising Parisian journal, *Le Matin*, is seeking to create an even more pretentious scheme, which it designates the International Automobile Fête, and which will consist of a 6,000 kilometer run round France for all classes of automobiles. The competitors will be weighed in at the Tuileries Gardens, Paris, on August 1, and for twenty-eight days will have to keep on running, stopping each night at the following towns: Deauville, Granville, Dinard, Brest, Nantes, Sables d'Otonne, Royan, Bordeaux, Pau, Luchon, Carcarsonne, Avignon, Le Puy, Brionde, Clermont Ferrand, Vichy (one day exhibition), St. Etienne, Villefranche, Aix-les-Bains, Thonon, Besançon, Colmar Mezières, Amiens, Dunkerque, Le Havre, Paris.

The competitiors are divided into three classes, (1) wheels, (2) fuel consumption, (3) endurance. The wheel class is sub-divided into three categories: ordinary penumatics, antiskids, and spring wheels. The fuel-consumption class comprises five sub-divisions, according to weight of vehicle and cylinder capacity, and the endurance class is also sub-divided into six, from motorcycles to heavy six-cylinder cars. With such a large number of classes and sub-classes, for each of which there is a first prize, winners are likely to be more numerous than losers. Most constructors hesitated to enter upon the 4,000 kilometers of the European Circuit on account of its length and expense, and it is quite likely that they will abstain from *Le Matin's* competition for the same reason. A hugely advertised tour with but a handful of starters, all of them prize winners, will do more harm to automobilism than the attacks of its enemies, and it is to be hoped that the Tour de France will not meet with the fate of the Algiers-Toulon motor boat race, also organized by *Le Matin*.

## MR. MUNSEY'S RUN—TOURS TO BIARRITZ.

In a letter received from Frank Munsey, the well-known publisher, who is touring Europe, he writes as follows:

"I made the automobile run of my life—Tours to Biarritz, 618 kilometers—and at an average speed through towns and stopping to inquire the way and slowing down for teams and bad spots in the road—going slowly, of course, through towns—an average speed during my running time of over 68 kilometers an hour. The total time was 13 hours and 23 minutes, which left a good margin of sunshine at each end of the run. But the actual running time was 9 hours and 29 minutes. We stopped 34 minutes at Angouleme to oil up the machine and take in gasoline, and at Bordeaux, 344 kilometers from Tours, we stopped 2 hours and 2 minutes for luncheon and to go over the machine and oil up, etc. We also lost 31 minutes in changing a tire—putting on a new one in place of one that could not stand the pace. And we lost 10 minutes on the wrong road and 9 minutes at the railroad crossings. With these deductions we were running but 9 hours and 29 minutes.

"I ran the car all the way and ran it hot, as you will fancy. I am inclined to think that the run for a little car—a 40-horsepower Mercedes, and that is small in these days—is pretty close to a record run for so heavy a car—a double phaeton body and with three people and baggage. To make such an average over 618 kilometers means that we must have made many kilometers at the rate of over eighty an hour and that on favorable bits of ground we certainly covered space at the rate of fully one hundred kilometers an hour. It was really a very remarkable run. People along the route watched us at times as they watched the Grand Prix racers the other week."

## GENERAL MANAGER MILES HOME AGAIN.

Samuel A. Miles, general manager of the National Association of Automobile Manufacturers, returned home from Europe Tuesday of this week, terminating a two months' vacation abroad, during which time he has toured in Great Britain and the Continent, and made a study of general trade conditions. Mr. Miles will meet the Glidden tourists at Bretton Woods.

# SPEED CHANGING GEARS—PLANETARY SYSTEM

WHILE the planetary transmission is rather a puzzling combination for the novice to comprehend without assistance, it is not particularly difficult to grasp the principles of its operation if a little patience is brought to bear. The diagrams in Figs. 1, 2 and 3 are not intended to show the arrangement of an actual practical transmission, but illustrate the planetary principle in a simple way for the purpose of explaining the various relative movements of the gears. The same reference letters are used in each diagram. Double circles represent gear teeth.

On the engine shaft is keyed a pinion *A*, which must, of course, rotate with the shaft when the engine is running. Four pinions, *BBBB*, mesh with the shaft pinion *A*, and also with an internal gear cut in the inner periphery of the outer ring *C*. A second ring *D* carries four studs on which the four intermediate pinions *B* can turn freely; the pinions are held in their proper relative positions by the ring *D*, but the ring does not interfere with their free rotation on their studs.

**DIAGRAMS SHOWING PRINCIPLE OF OPERATION OF TWO SPEED AND REVERSE PLANETARY TRANSMISSION GEAR.**

Arrows show direction of rotation of parts. The absence of arrows indicates that the parts are not rotating about their own axes.

Fig. 1.—Slow speed forward. Outer casing C stationary. Stud ring D, pinions B and shaft pinion A all revolving.

Fig. 2.—Reverse. Outer casing C revolving. Stud ring D stationary. Pinions B and shaft pinion A revolving.

Fig. 3.—High speed forward. Outer casing C, stud ring D, pinions B and shaft pinion A revolving with engine shaft.

### Relative Movements of the Planetary Gears.

For the sake of simplicity, let us suppose that this transmission is to drive the car by a chain and that a slow speed forward is desired. A sprocket for the chain is attached to the pinion ring *D* and the internal gear *C* is held by external means so that it cannot rotate. This is indicated in Fig. 1. The engine is started and the shaft carrying the pinion *A* rotates in the direction shown by the arrow, while pinion *B* is obviously driven in the direction shown by its arrow. Its teeth on the side opposite to the point of engagement with pinion *A* are in mesh with internal gear *C*; but the internal gear is prevented from turning, and therefore the pinion *B* is constrained to roll around in the space between *A* and *C*, carrying with it the ring D and the driving sprocket. If pinion *B* is of the same diameter as pinion *A* both will rotate on their own axes at the same angular velocity—the same number of revolutions per minute—but the planetary motion of pinion *B* in its orbit around the sun pinion *A* will be much slower and the number of revolutions per minute made by the sprocket attached to the ring *D* will, of course, be the same as the number of times the pinion *B* traverses its orbit.

### A Simple Illustrative Experiment.

A homely but simple and convincing illustration of this movement may be had by taking a small round box or other wheel-like object to represent the pinion *A* and a pencil to represent pinion *B*; crook the first finger around the periphery of the round box to represent the internal gear *C*, holding the pencil (pinion *B*) lightly between the round box and the finger. Now with the other hand turn the box, keeping the crooked finger stationary, and the pencil will rotate on its own axis and also rotate in its orbit around the box (pinion *A*) exactly as in the planetary gear.

This gives the sprocket a slow rotation in the direction of rotation of the engine shaft, giving the car its slow speed forward. In order to drive the car backward—to reverse it—the sprocket carrying the driving chain must be transferred from ring *D* to the internal gear *C*, which now becomes the driving part of the transmission. If the engine shaft and gear *A* are now rotated, as in Fig. 2, still in the same direction, and the stud ring *D* held from turning, as was ring *C* in the first case, the gears will rotate as the arrows show. Pinion *B* will, of course, rotate on its own axis as before; but that axis is now fixed and immovable, while the internal gear *C* is free to turn, as shown by its arrow, carrying the driving sprocket along with it and driving the car slowly backward.

The high-speed is a direct drive, the transmission rotating bodily with the engine shaft and in the same direction as in Fig. 3. It is only necessary to clamp any two of the elements together—the rings *C* and *D*, or either one of the rings and the engine shaft. In this way the pinion *B* is prevented from rotating on its axis and relative movement of the various pinions and the internal gear is impossible and the whole combination rotates with the shaft like a flywheel. This is one of the important advantages of the planetary gear, the high-speed drive being direct, exactly as if the sprocket was mounted directly on the engine shaft without intervening gears. Cars using two-speed planetary gears are usually intended to run on the direct drive under all ordinary conditions, and the gear ratio of the direct dirve is calculated accordingly. The all-round efficiency of the car is thus high, as a rule.

### A Practical Arrangement of Planetary Gears.

It is evident that in practice it would not be possible to shift the sprocket from place to place as has been done hypothetically in the foregoing explanation, so two separate sets of gears are used. Fig. 4 shows how this is accomplished. While, for the sake of clearness, the drawing differs from the actual gear in its exact proportions and in the details, the arrangement is identical with that of a planetary gear of a widely-used type of American automobile. On an extension of the engine shaft *A* two pinions, *B* and *C*,

are keyed; these correspond to the pinion *A* in Figs. 1, 2 and 3, and mesh with the planetary pinions *DD* and *EE*, which correspond with pinions *B* in Figs. 1, 2 and 3. A sleeve *F* carries the stud-plate for the pinions *D*, the internal gear that meshes with pinions *E* and the driving sprocket *G*, these parts always rotating together as one piece. The internal gear meshing with pinions *D* is carried on a plate *H* running loosely on the engine shaft, and the stud-plate *I* for pinions *EE* is carried by a sleeve at the opposite end of the transmission, also running freely on shaft *A*. A drum *J* is formed by an extension of the stud-plate *I*. A clutch *K*, always of the friction type and here shown as a cone clutch for the sake of clearness, is formed by a member sliding on a short squared portion *L* of shaft *A*, and moved back and forth by the usual collar and groove arrangement, and a recessed portion *M* formed integral with the web of the plate *H*. Two bands, *N* and *O*, similar to ordinary brake bands, encircle the drums *J* and *R*, and are anchored to some stationary part of the car or engine frame. By means of suitable pedal or lever connections the bands can be closed around their drums at the will of the driver.

Now, if we tighten the band *N* on drum *J* and look at the transmission from that end, the movements of the parts will be exactly as shown in Fig. 2. The stud-plate carrying the intermediate pinions *EE* is prevented from turning by the band, so the pinions turn on their own axes and drive the internal gear, which obviously carries the sprocket, in the opposite direction to the engine shaft. The gears in the second set, meanwhile, are running around loosely.

To obtain the slow speed forward, the band *N* is released and the band *O* is tightened on its drum *R*. The conditions are now the same as shown in Fig 1, the internal gear on *R* being held stationary and the intermediate pinions *D D* and their stud-plate (ring) left free to move, the pinions rotating on their own axes and rolling around inside of the stationary internal gear and carrying the stud-plate along. As the stud-plate is also connected with the sleeve that carries the sprocket, the car will be driven forward on the slow gear. The opposite set of gears is now running idle in its turn.

### Clutch for the Direct Drive.

Clutch *K M* comes into play for engaging the direct drive. The brake bands are both loosened and the sliding member *K* of the clutch is brought forward until it locks with its corresponding member *M*. Pinions *D D* are now held from rotating because the internal gear with which they mesh is in effect solid with the pinion *C* with which they mesh on the other side. Therefore the pinions cannot rotate on their axes, but act as rigid transmitters, driving the sleeve *F* and the sprocket *G* at the same speed as the engine shaft. And as exactly the same state of affairs exists at the other end of the transmission, the whole combination goes around with the engine shaft *A*, the only effect being the addition of a certain amount of weight to the rotating parts.

Lubrication of the planetary gears is usually effected by bringing the edges of the stud-plates and the drums very close together and filling the intervening spaces with oil-retaining washers and putting heavy oil or grease into the drums. The sleeves rotating on the engine shaft are often fitted with separate oil cups or grease of the cups of the compression type.

The planetary transmission is usually controlled by a single hand lever acting through a comshaft, cams and connecting rods upon the friction bands. A sketch of the gear connections is shown in Fig. 5. *A* is the drum, *B* the brake band, *C E* lugs riveted to the split ends of the band, *E* a rod passing through both lugs and having a nut on its threaded end *F*, *G* a spring tending to keep the lugs apart, and *H* a support for the friction band, secured to some convenient part of the framing. When the rod *E* is moved in the direction shown by the arrow, by means of the hand lever and cam, lug *C* is drawn toward lug *E*, compressing the spring *G* and closing the band *B* upon the drum. Lug *E*, being held by *H*, remains stationary, rod *E* sliding easily through the hole. To release the band, the pressure of the cam is taken from the rod,

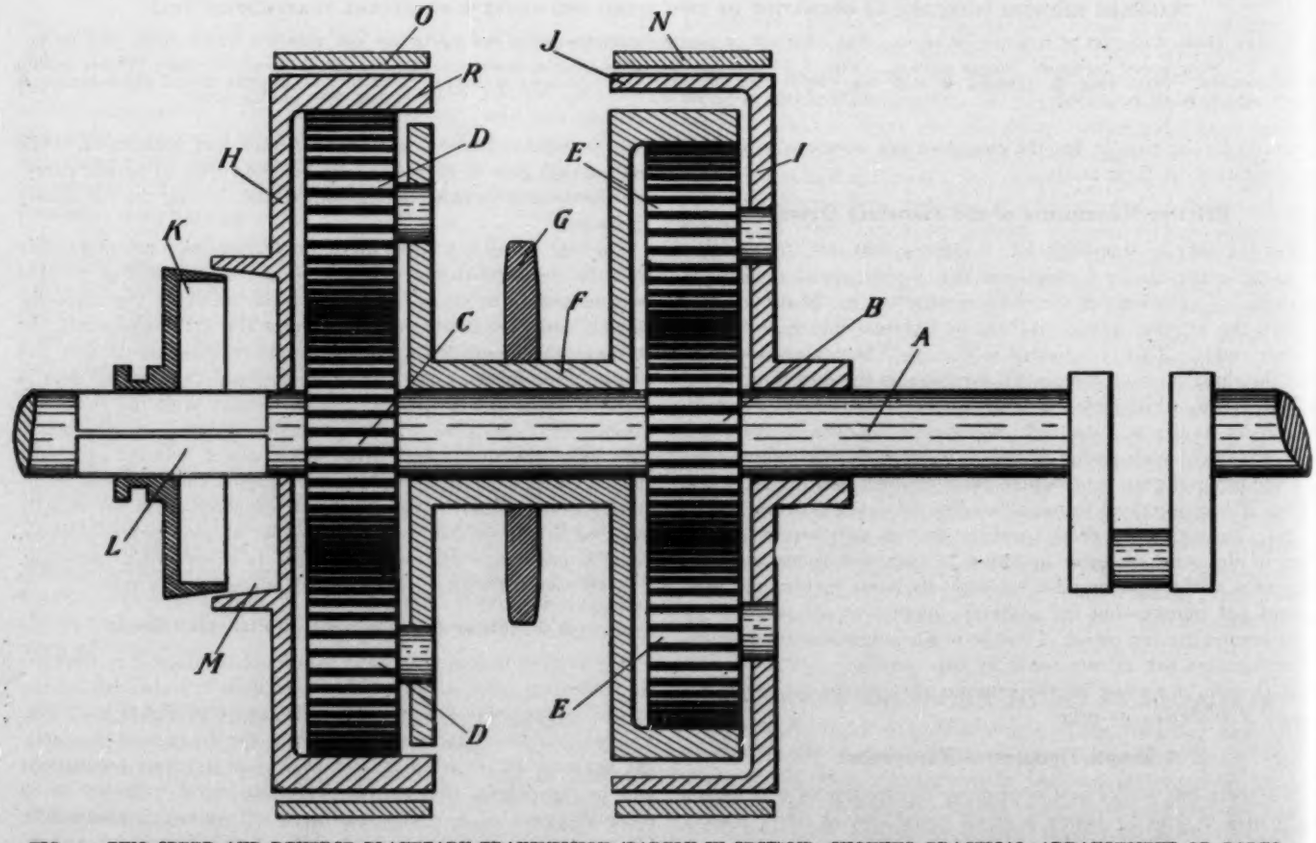



FIG. 4.—TWO SPEED AND REVERSE PLANETARY TRANSMISSION (PARTLY IN SECTION), SHOWING PRACTICAL ARRANGEMENT OF PARTS.

when the spring *G* forces the lugs apart, carrying the band away from the drum. Wear of the drum and band which might cause the band to slip excessively even when drawn as tightly as possible by means of the cam, is taken up by the nut on the threaded end *F* of rod *E*.

Sometimes the reverse or slow speed is operated by a separate pedal or lever, but more often all three speeds are controlled by a single lever placed at the driver's side moving from reverse to high speed progressively.

Three-speed planetary transmissions are met with in a few cars. The extra speed is obtained by adding another pinion, sleeve and brake band or its equivalent. In this form the planetary transmission is used on some full-sized touring cars, with excellent results. The idea that the planetary transmission is suitable only for small cars and light work is contradicted by the employment of planetary gears in cars up to 30 horsepower and in commercial vehicles of considerable size. Made appropriately heavy, the planetary transmission has given a good account of itself in commercial work, its ease of control and smoothness of engagement and the impossibility of stripping the gear teeth by suddenly changing speeds being greatly in its favor when inexpert operators must be reckoned with.

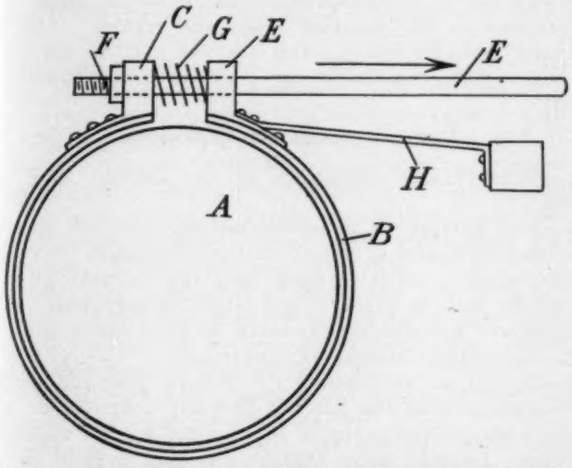



FIG. 5.—ARRANGEMENT OF BRAKE BAND AND CONNECTIONS.

By slightly changing the arrangements of the gears and other parts planetary transmissions are used for shaft drive, in which case the sprocket is of course not required. The driving sleeve is arranged to be in the rear of the gears so as to connect with the propeller shaft.

Another change that is sometimes made in the design of the planetary transmission gear is to substitute ordinary external spur gears for the internal gears, some manufacturers considering this a better form of construction. In order to secure quiet running on the slow speed or reverse, rawhide or fiber pinions have been tried in a good many instances; but it was generally found that well-cut steel gearing was better in every way, and did not wear out as rapidly as the softer materials. Again, oil is usually injurious to fiber and rawhide, having a softening effect, and this sometimes caused trouble. Bronze pinions are also used, with good results.

Brake bands, such as are shown in the drawings, are not infrequently replaced by cone or other friction clutches, especially in larger transmissions. There are a great many other details in which planetary transmissions are changed from the arrangement shown in the drawings, but the fundamental principles remain the same in all cases, and a thorough comprehension of the gear here shown will enable the reader to figure other types out for himself.

While the planetary gear is used to a considerable extent abroad, it is essentially an American development, and has gone through all the intervening stages from a noisy, inefficient and generally troublesome affair to the present quiet-running, smooth-working and efficient speed changing mechanism.

## AUTOS NOT A MARINE RISK.

BOSTON, July 23.—According to an opinion given by the Attorney-General of Massachusetts, based on a request for an interpretation of the law by the insurance commissioners, marine insurance companies cannot legally insure automobiles against liability for damage resulting from collision. The opinion and the comment of the insurance commissioner are contained in the advance sheets of the insurance commissioner's annual report which have recently been issued. The commissioner says:

"One of the vexed questions in the administration of the affairs of this department relates to the latitude in issuing policies which may be allowed a marine insurance company under the law. The statute is vague. It allows a company of that class to insure 'vessels, freights, goods, money, effects and money lent on bottomry or respondentia, against perils of the sea and other perils usually insured against by marine insurance, including risks of inland navigation and transportation.' What may be included in 'other perils usually insured against by marine insurance'? If the field broadens by the assumption of new classes of risks, and the phrase is re-enacted from time to time in successive recodifications of the law, does it make it lawful for marine companies to do now what they could not have done when the words in question first went into the law more than fifty years ago?

"Such questions come to the front from time to time. Recently one appeared through the desire of owners of automobiles to procure insurance against the damage their machines might do by collision with other objects. In other words, they desire to protect themselves against their liability for damage which their machines might occasion. Certain marine companies desired to incorporate this protection in such policies as they might issue on this class of property, under the right to insure risks during inland transportation. As it was by no means clear that it could be done lawfully, the question was referred to the Attorney-General, the legal adviser of the state departments. It appears that, in his opinion, the collision hazard may not be assumed by a marine company in insuring an automobile."

The sample policy submitted to the Attorney-General contained the following clause:

> This policy is extended to cover, whilst not in conveyance, the risk of loss and of damage to the automobile hereby insured, caused by collision with another object, whether moving or stationary, excluding always all claims for damage through detention, demurrage or loss of use.
>
> And it is further agreed, that if the automobile hereby insured shall come in collision with another object, whether moving or stationary, and the assured become liable to pay, and shall pay, any sum or sums for damages resulting therefrom to said other object, in such case these assurers will contribute towards the payment of the total amount of said damages, in the proportion that the sum insured under this policy bears to the total valuation of the automobile, as stated herein, provided that these assurers shall not in any event be held liable under this agreement for a greater sum than the amount insured under this policy.
>
> It is also subject to the condition that there shall be no liability for any damages resulting from collision occurring while the automobile is being operated by any person under eighteen years of age, or in any race or speed test.

In his opinion the Attorney-General refers to the opinion of his predecessor that automobiles might be insured under a marine policy, and then quotes from cases which lead him to the following conclusion: "I am of opinion, therefore, that marine insurance companies in Massachusetts are not authorized to issue policies insuring an automobile owner against loss and liability caused by the collision of his automobile with another object."

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**An interesting item of news** comes from Berlin: Baron Brandenstein, the great organisator of the Imperial A. C., is about to resign his office as secretary to enter the German arms and munition factory at Berlin as its managing director. The loss for the club will be a very great one, as the success of all the big events held in Germany can be traced back to him.

# CATECHISM OF THE GASOLINE AUTOMOBILE*—VII

By FORREST R. JONES, M.E.

Q.—WHAT kind of lubricant is suitable for roller bearings?

A.—The same as for ball bearings, except the thicker grease. A thick grease will prevent the free rotation of the rollers and may have a tendency to throw them out of alignment with the journal.

Q.—How should cup-and-cone ball bearings be adjusted when replacing a wheel?

A.—So that the wheel will turn perfectly free. A little looseness is not objectionable. A tight bearing is apt to crush the balls or damage the ball race (cup or cone).

Q.—What is the remedy for a cut or seized plain journal bearing?

A.—If it is a split bearing, open it by removing the cap. Smooth the convex surface with a fine-cut file or fine emery paper folded over a stick or file. Scrape the concave surface with a hard metal scraper or smooth it with emery paper. Large, hard lumps may be chipped off first with a cold chisel. Lubricate with a thin oil.

A solid bearing, or one difficult to open, can generally be worked free by oiling and turning, first slightly backward, then forward, and so on.

### Carbon Deposit in Cylinders.

Q.—What causes carbon deposit on the walls of cylinder?

A.—Too much lubricating oil or gasoline.

Q.—How is carbon deposit removed from the combustion chamber, cylinder walls, and piston head?

A.—By scraping off and wiping clean. Kerosene and gasoline help to cut the gummy mixture of oil and carbon, but have no effect on the hard, dry carbon.

When the piston drags hard in the cylinder on account of oil and carbon between them, it can be freed by pouring kerosene or gasoline on it and working it back and forth by the hand crank or flywheel. The kerosene can be put in at the top of a vertical cylinder, or at the usual oil hole of a horizontal one.

Q.—What troubles may be caused by excess of carbon deposit in the combustion chamber or on the piston head?

A.—Preignition; kicking when cranking; backfiring into the carbureter; scoring the cylinder by a loose flake; sudden loss of compression by a flake getting under the exhaust valve.

Carbon may get under the piston rings and prevent their elastic action.

The deposit is apt to be in the form of "barnacles," which become incandescent and ignite the incoming charge while the inlet valve is still open, thus causing backfiring into the carbureter, or, if not ignited while entering a charge may be fired just before compression is completed. This premature ignition has the same effect as advancing the spark too far and the corresponding stresses are produced in the parts of the engine.

An engine with considerable carbon deposit frequently continues running some time after the ignition circuit has been broken, thus making it impossible to stop the engine when the carbureter throttle does not completely close the mixture inlet.

Q.—How can you test gasoline for its suitability to use in the engine?

A.—By use of the hydrometer.

Q.—What is the hydrometer?

A.—The ordinary type is a short tube of glass with a stem similar to that of a thermometer, and has a small receptacle at the bottom in which lead shot is placed to cause the instrument to stand vertical and sink into the liquid until well covered. The stem, part of which remains above the liquid, is graduated, and the graduations marked.

Q.—How far should the Baumé hydrometer sink into gasoline suitable for the internal-combustion engine?

A.—To the 76- or 74-degree graduation on the stem. The temperature of the gasoline affects the reading. The hydrometer sinks further in warm gasoline than in cold. The reading is higher in numerical value when the gasoline is warm.

### Late and Premature Explosions.

Q.—What causes explosions in the exhaust pipe and muffler?

A.—The passage of unburned mixture into the exhaust pipe, due to misfiring in one or more cylinders. The unburned mixture, after passing into the exhaust pipe, is ignited by the hot gases of the following explosion, or by incandescent particles on the walls of the exhaust pipe.

Q.—Are muffler explosions dangerous?

A.—Not so far as bursting the exhaust pipe and muffler is concerned, when the latter is properly constructed. Explosions which have partly wrecked a car are not unknown, however. Heaters using exhaust gas may explode or set fire to the body of the car. The only other ordinary danger is starting a fire in a garage where gasoline is vaporized.

Q.—What causes backfiring in the intake pipe?

A.—Too lean a mixture (air not sufficiently carbureted; a lean mixture may be caused by air drawn through a leak in a joint of the pipe between the carbureter and engine); an overheated cylinder; incandescent carbon on the walls of the combustion chamber; a weak inlet valve spring which does not close the port before ignition occurs; a dirty or bent inlet valve stem.

Q.—If the cylinder is cracked or has an opening around a plug leading from it to the water-jacket space, what are the indications when the engine is running?

A.—Loss of power and excessive heating of jacket water. If water cooled, there may also be misfiring after running an hour or so,

Q.—What are some of the causes of a cracked cylinder?

A.—Lack of circulating water or initial stresses in the casting.

### Compression and Leaks.

Q.—How do you test the compression?

A.—Crank the engine slowly by hand. There should be considerable resistance to turning, and when the pull on the hand crank is lessened, the engine should turn backward a small part of a revolution. If the cylinder petcocks are open, there can be no compression. To test one cylinder of a multicylinder engine, open the cylinder petcocks of the others; or, if there are no cylinder petcocks, lift the inlet or exhaust valves from their seats by inserting a coin, a piece of sheet metal, paper or cardboard between the end of the valve stem and the part that presses against it to lift the valve.

Q.—Loss of compression may be due to what causes?

A.—A leaky valve. Clean or grind in.

A weak spring on the automatic inlet valve. Get a new spring or stretch old one.

A leaky piston. Get new rings, or rebore the cylinder.

Dirt under the valve. Rotate the valve on its seat. This can often be done by gripping the stem and rotating the

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valve on its seat. The pressure on the seat may be partly relieved for this purpose by inserting a wedge at the end of the stem, or turning the engine till the cam acts slightly.

Loose or leaky ignition apparatus or parts stopping openings into the cylinder. Put lubricating oil around parts and look for bubbles when compressing the charge.

A leaky cylinder plug.

A cracked cylinder.

A leaky petcock. Regrind the plug with fine emery and oil.

Q.—How is compression relieved when cranking to start the engine?

A.—In some engines the exhaust camshaft has two sets of cams. When the crank is pushed in to engage with the crankshaft, the exhaust camshaft is moved endwise so as to bring the auxiliary cams into action. The latter hold the exhaust valves open during part of the compression stroke.

Q.—What causes an inlet or an exhaust valve to leak?

A.—Fouling of the valve or its seat; warping of the valve by heat; a particle of carbon scale from the combustion chamber getting between the valve and its seat; and, in the exhaust valve, pitting, or even a foul stem that has collected enough carbon to make it bind in the guide (hole through which the stem passes); a bent valve stem.

Q.—What is "pitting" in a valve? And how caused?

A.—Small pits formed in the part of the exhaust valve that rests on the seat. They are caused by the hot products of combustion escaping through the port.

Q.—What causes an exhaust valve stem to stick or bind in its guide, and what are the remedies?

A.—Oil and carbon (soot) from the combustion chamber sometimes collect around the valve stem when exhausting and then dry, leaving a hard coating of carbon on the stem and guide which causes it to fit tight and bind in the hole; or carbon alone in the form of soot is deposited on the stem with the same result. The stem may be warped or bent. Kerosene put on the hot stem while in place cleans it fairly well. This can be done on the road. Gasoline cuts the oil and carbon loose better than kerosene when the parts are cool. A thorough cleaning requires the removal of the valve, and scraping is sometimes necessary. Straighten a bent or warped stem.

Q.—How can a broken valve spring of the coiled type be temporarily kept in use?

A.—By placing a metal or wood fiber washer between the broken parts. The washer should fit loosely on the valve stem.

Q.—How do you test for a leaky valve?

A.—The test by compression is only partly satisfactory, since leakage may occur at the piston or other places as well as at the valve. If the compression is poor, remove the valve and examine for pitting. If pits do not appear to any great extent, put it back in place and rotate with a screwdriver or pin-wrench while pressing it down on its seat (the valve has a slot for a screwdriver or holes for a pin-wrench), then remove and examine the bearing surface. If the valve fits well, both it and the seat should be bright all the way around. If it is impossible to tell whether the surfaces have been rubbed over all the way around, put a very little of a thin mixture of red lead and oil or white lead and oil over the bearing surfaces, or rub a piece of chalk over them, and rotate as before. If the bearing surfaces do not have a clean ring rubbed by rotating the valve on its seat, it is a sure indication of a leaky valve. If the surfaces are rubbed clean, however, the valve will generally be tight. It may happen that it was not ground properly before, and that the surfaces were warped. This will allow them to rub together so as to become bright throughout the entire circle, and the valve will fit on its seat properly in one position, while in another it would allow leakage. Bear this in mind.

When the inlet and exhaust pipes can be readily disconnected from the port openings, a piece of thin paper held over the opening will indicate whether air is forced through under the valve during compression. A candle can be used for the same purpose if there is no gasoline in or about the car.

Q.—How is a leaky valve ground to fit its seat?

A.—Mix oil or vaseline with fine emery, ground glass or some other abrasive substance, and place on the bearing surface of the valve. Then put the latter in place and rotate it a short distance back and forth (something less than a quarter turn) a few times, then lift slightly from the seat and give it about a quarter turn, then rotate back and forth as before, and lift from the seat to move it to a new position, and so on. The valve should not be turned through a complete rotation without lifting except at the beginning of regrinding a valve that is in very bad condition, since a complete rotation is apt to cause scratches running around the entire circumference. The valve should be lifted from its seat and examined at intervals to determine how the work is progressing. The port should be stopped with a piece of cloth or waste to prevent any of the abrasive from dropping in. Clean the parts scrupulously after grinding. Abrasive carried into the cylinder will cut and score it, causing rapid wear and piston leaks.

Emery two or three grades coarser than flour emery is suitable at the beginning, and a finer emery or powdered pumice stone may be used for finishing.

Q.—How can you test for a leaky piston?

A.—In some types of engines, generally those with horizontal cylinders, the open ends of the cylinders can be exposed to view by removing the crankcase cover.

If the leak is a bad one smoke will be blown out between the piston and cylinder walls.

Q.—How do you test for a cracked cylinder or a leaky plug in the wall between the combustion chamber and water jacket?

A.—Try compression by cranking. If it is poor, then remove the water pipe from the top of the cylinder, disconnect the circulating pump, fill the water jacket to the top of the opening where the pipe was connected and crank the engine with the petcock closed. Bubbles will rise to the top of the water if the cylinder is cracked or the plug between the combustion chamber and the water jacket is very loose. If no air bubbles appear, then jack up the rear wheels so they are free, start the engine, throw in the clutch, put on the brakes, open the throttle, and advance the timer. If gas bubbles do not appear after running the engine for some time, then the engine is tight. Do not mistake the air bubbles which form on the cylinder walls for gas bubbles. Steam bubbles will also rise after considerable running of the engine.

Q.—How are piston rings put into place and prevented from turning around on the piston?

A.—They are sprung open and slipped down over the piston until they snap into the groove. A pin is often driven into a hole in the bottom of the groove of the piston, which projects into a hole or notch in the ring, and thus prevents its rotation about the piston. The rings are so placed that the joints or openings in the different rings do not come opposite each other. This is done to prevent the gas which may leak through the opening of one ring from passing directly through the opening of the next. The pin should fit loosely in the ring. When lap joints are used where the ring is cut, a pin for preventing rotation is not always provided.

Q.—How is a piston ring removed?

A.—By lifting one end and turning it slightly in the groove until it rides on top of the pin, then continue turning and pressing the ring slightly to one side. This will lift it completely from the groove, so it can be slipped off the end of the piston.

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**Oil is fatal** to rubber and water will rot the fabric of your tires if admitted. Keep both where they belong.

# INDICATED HORSEPOWER AND INDICATORS

By HAROLD H. BROWN.

WE can well imagine that in spite of the comparatively favorable conditions under which the horsepower was first used as a unit of power Watt's position, probably, was not an enviable one when his engines were originally put on the market. No doubt complaints poured in pretty rapidly that the two-horse engine would not do the work that one poor, overworked horse would do (on a pinch), and we can readily imagine that he may even have been threatened with damage suits. It can readily be imagined that Watt felt called upon many times to demonstrate that his engines developed all the power which he claimed for them, and that he cast about for some means of doing this.

Of course the first method that would suggest itself would be a brake test, but in many cases this would be impossible owing to the surroundings. Then, again, it would be necessary to disconnect the engine from the machines which it was intended to drive, and this would be a disadvantage, as it would be usually desirable to find out what power was required to drive them.

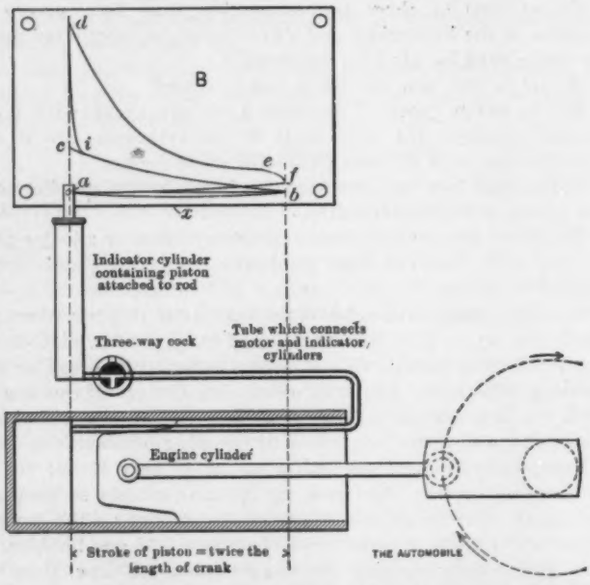


FIG. 1.—DIAGRAMMATIC VIEW OF INTERNAL-COMBUSTION ENGINE CYLINDER CONNECTED TO INDICATOR, AND DIAGRAM DRAWN BY THE LATTER INSTRUMENT.

It may be remarked here that many ingenious machines have been devised, which are known as "transmission dynamometers," to measure the power passing through them, but as they are outside the scope of this article they will not be considered.

The problem which confronted Watt was to devise an apparatus which could be connected to an engine with comparative ease and which would measure the power developed by this engine while actually doing the work for which it was designed, such as running a mill or pumping water. He accomplished this and much more when he devised his indicator. In fact, the simple measurement of the power developed by an engine has become a small part of the use of an indicator in modern steam and gas engine practice. The most important of its uses at present are the detection of errors in design, such as poor valve setting, constricted inlet and exhaust ports, poor carburation, low or too high compression, and the like.

Briefly stated, the indicator is a device for recording the pressures in the cylinder of an engine, pump, compressor, or other like apparatus, during an entire cycle of its operations. In order to understand how this is accomplished let us refer to Fig. 1, which is simply a diagrammatic sketch of a four-cycle internal combustion motor, connected to a very elementary form of indicator, which would probably never be used in practice, but which, perhaps, will make the principle clearer than would a drawing of the ordinary form.

In the lower part of this drawing are the essential parts of a gas engine: the cylinder, piston, connecting rod and crankshaft. For the sake of simplicity the valve and igniter gear are not shown. Above the cylinder of the motor is the indicator cylinder; this cylinder contains a piston, to which is attached a piston rod that carries at its top or outward end a pencil point, which bears on the drawing board *B*. The piston of the indicator is acted on by a coiled spring of known strength, interposed between the piston and the top of the cylinder, and encircling the piston rod, so that pressures on the under side of the piston are indicated by the vertical position of the pencil point *a* on the board *B*. A U-shaped pipe serves to connect the cylinder of the motor—by means of an opening in the piston—and the indicator cylinder, and also serves to support the indicator cylinder and move it to and fro as the engine piston moves out and in. A three-way cock shown near the indicator cylinder serves to connect the latter with the motor, or open it to the atmosphere. In the drawing the indicator and motor cylinders are shown connected through the three-way cock. If, however, we move the plug of the cock one-quarter turn to the right, the indicator cylinder will be opened to the atmosphere. If we then start the motor and bring the pencil point into contact with the paper on the board *B*, a straight line *ab* will be traced. This line is called the "atmospheric line." If, however, we again turn the cock back to its original position, as shown in the drawing, so that the indicator piston and motor piston are in communication with each other at the beginning of the suction stroke, we shall find that during the suction stroke a slightly downward curved line *axb* will be drawn, instead of the atmospheric line *ab*; this is owing to the vacuum which it is necessary to form in order to draw the combustible charge into the motor cylinder. During the compression stroke, as the motor piston returns to its original position and as the pressure rises, the pencil point of the indicator will trace the line *bi*, or if ignition did not take place, the line *bc*. When ignition takes place at *i*, the sudden rise of pressure in a comparatively short time causes the vertical line *id* to be traced. During the outward or working stroke the pressure falls as the volume increases, and the line *de* is traced by the indicator pencil.

At *e* the exhaust valve opens and the line takes a rather sudden change of direction, so that at *f* it is very near the atmospheric line *ab*, and during the exhaust stroke the line *fa* gradually approaches the atmospheric line, and when it reaches *a* the cycle is complete.

A little reflection will show that a certain amount of force is necessary to move the motor piston on the outward suction stroke against atmospheric pressure, also inward against the compression pressure, on the compression stroke, and there is also a slight amount of work necessary to be performed in moving the piston backward on the exhaust stroke. The amount of work done on the explosion stroke is represented by the expansion curve *def*. In order to find the work done by the motor, during one of these strokes we must find the average pressure per square inch during that stroke, multiply this by the area of the piston in square inches and by the stroke in feet, and this will give us the number of foot-pounds of work done during that stroke.

If we subtract the work done on the suction, compression and exhaust strokes from that done on the working stroke, we will have the net work done by the gas per cycle. Multiplying this by the number of cycles per minute (one-half the revolutions per

minute in a four-cycle cylinder) will give us the total number of foot-pounds of work done per minute, and dividing this by 33,000 gives us the indicated horsepower of the motor. Of course, we might just as well add together the average pressures during the exhaust, suction, and compression strokes, and subtract this from the average pressure during the working stroke, and this result would then be called the mean effective pressure—usually written M. E. P.

This M. E. P. multiplied by the area of the piston and then by the stroke in feet gives us the work per cycle, and this amount multiplied by the number of cycles per minute and divided by the constant 33,000, gives us the indicated horsepower as before. The formula becomes:

$$\text{I.H.P.} = \frac{\text{M.E.P. (No. explosions per min.) (Stroke in ft.) (Area piston in sq. in.)}}{33{,}000}$$

In practice it has been found that the pressures during the exhaust and suction strokes are too slight to greatly affect the result of the indicated horsepower, and therefore they are neglected and only the figure embraced by the first part of the exhaust stroke, the last of the compression stroke, and the working stroke, is considered. The M. E. P. is found by finding the area of this diagram and dividing by the length of the diagram, and then multiplying this result by the proper constant. The area is generally found by a very ingenious instrument known as a planimeter. This is shown in Fig. 2.

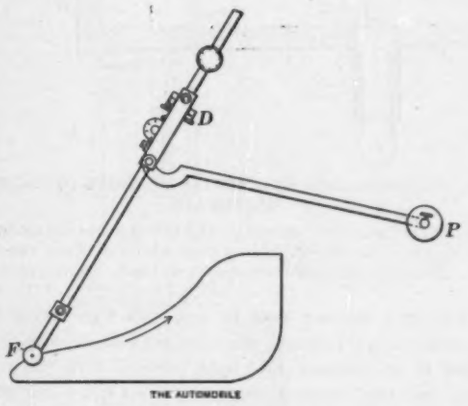


**FIG. 2.—THE PLANIMETER**

Sketch showing instrument used to measure area of indicator diagram. The pivot P is fastened to the board, on which the indicator card is laid perfectly flat. The index wheel D is set to zero and with the point F the outline is traced exactly once. The area can then be read on the index D. For the most accurate results an average of the difference of consecutive readings is taken.

Probably it has already occurred to the reader that the theoretical indicator described is very impractical. In the first place it would be very difficult to connect the indicator cylinder to the motor piston, and in the second place, the length of the diagram would be very inconvenient, in some cases at least. Another point which might occur to one is the possibility of the volume of the indicator cylinder and the pipe leading to it affecting the pressures in the motor cylinder. These drawbacks are all overcome in the modern steam engine indicator, which is shown in Fig. 3.

In the first place a little reflection will show that if we keep the indicator cylinder stationary and move the paper under the pencil to correspond to the motion of the motor piston, we shall still obtain a diagram similar to that shown in Fig. 1. In the ordinary modern form of indicator the paper is placed upon a drum, which is turned back and forth about its axis, through a suitable angle, by mechanical means. It is generally desirable to have the diagram not more than from two to three inches long, and in order to do this the drum of the indicator must be in most cases connected to the piston by means of a reducing motion; these are of various patterns. The drum of the indicator is rotated in one direction, during the outward stroke of the engine, usually by the pull of a cord wound around the drum; during the return stroke it is rotated in the opposite direction by a spring which is inside of the drum and which at all times keeps the operating cord under tension. In case the stroke of the engine does not exceed two or three inches the cord may be connected directly to the piston, or in the case of a

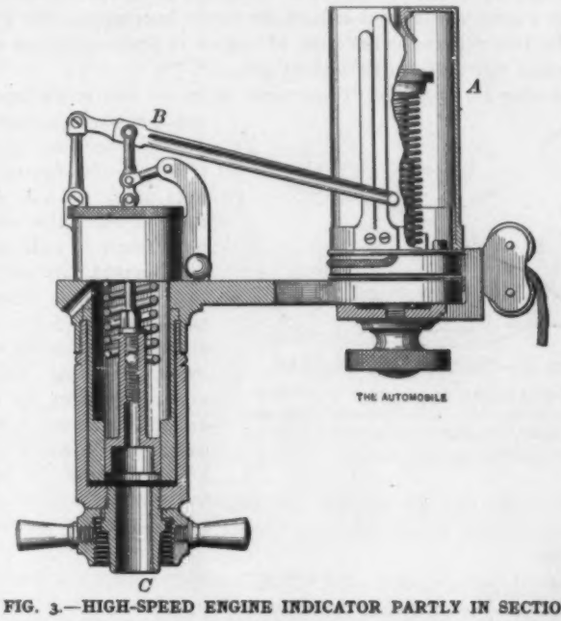


**FIG. 3.—HIGH-SPEED ENGINE INDICATOR PARTLY IN SECTION.**

Note the drum A at the right, which rotates about its own axis and to which the indicator card is secured by clips; also the pencil motion B, which magnifies the motion of the indicator piston, thus reducing the volume of the indicator cylinder and also the inertia effects of the piston and attachments. The pipe C below the indicator piston, fitted with screw coupling, is connected to the engine cylinder.

double-acting steam engine, to the crosshead. However, if the stroke is much more than this, the indicator drum must be connected through some form of reducing motion. A very popular form of this consists of two drums, to the smaller one of which is connected the cord which operates the indicator drum, and to the larger one the cord which is directly connected to the crosshead or piston. An indicator combined with this type of reducing motion is shown in Fig. 4.

Another fact which should be borne in mind is that it is desirable to keep the volume of the indicator cylinder as small as possible and the inertia and movement of the indicator piston small also. This is accomplished by magnifying the motion of the piston by attaching the pencil to a lever arm. In order to make a single indicator applicable to different engines or to all the cylinders of a multiple cylinder engine, it is sold with a number of coiled

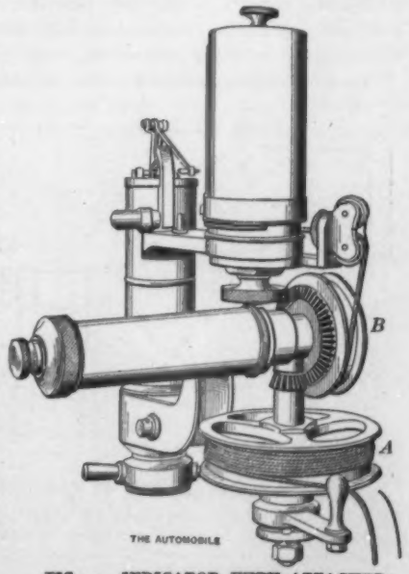


**FIG. 4.—INDICATOR WITH ATTACHED REDUCING MOTION.**

Note the large wheel A to which the cord from the piston or other reciprocating part of the engine is attached, and the small wheel B to which the indicator cord fastened to the drum is attached.

steel springs which may be interchanged when occasion arises. These springs are classified by the number of pounds which are necessary to cause the pencil of the indicator to rise one inch; thus a 10-pound spring would be one which would require an increase of pressure of 10 pounds per square inch to cause the pencil to rise 1 inch.

It may be here remarked that while the indicated horsepower of an engine will always exceed the brake horsepower, the ratio of the two for any given type of engine is pretty constant and generally lies between 80 and 90 per cent.

As long as the speed of an engine does not run much beyond 400 or 500 revolutions per minute no great difficulty is found in obtaining good diagrams with the ordinary form of indicator, but beyond this we are likely to get distortions owing to the inertia of the piston and other moving parts, and also owing to the difficulty of making the passages between the indicator and the cylinder large enough so that the pressure fluctuations in the motor cylinder will be followed exactly by those in the indicator cylinder.

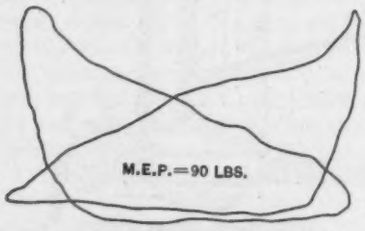


FIG. 5.—STEAM ENGINE DIAGRAM.

This is a diagram taken with an indicator from the high-pressure cylinder of a fast running torpedo boat type of steam engine, at full speed.

A good example of a card which is probably near the limit of what can be accomplished with the ordinary form of indicator is shown in Fig. 5. This is taken from the high-pressure cylinder of a set of engines of the torpedo-boat type when running at full speed. The indicators used were especially made, with small cylinders and light pencil motion. The diagrams were taken on a chemically prepared paper, on which only a very light touch of the pencil was necessary to make a mark.

It is probable, however, that owing to the much more sudden changes of pressure in the cylinder of a high-speed internal-combustion engine, that the limit of speed revolutions per minute at which diagrams could be satisfactorily obtained with the ordinary indicator is much lower than with steam. Another difficulty which confronts one in the use of the ordinary indicator as applied to automobile motors is the fact that they are mostly constructed with inclosed cranks, and it would be extremely difficult to apply the ordinary reducing motion to them.

These difficulties have led to the design of several special types

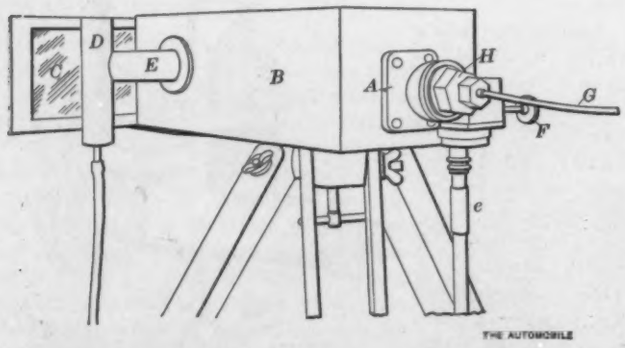


FIG. 6.—GENERAL VIEW OF CARPENTIER MANOGRAPH.

Note, manograph is mounted on tripod ready for use. Reference letters correspond to those employed in Fig. 7.

of indicators; one of the first of these to make its appearance and which has received a good deal of favorable attention is the "Manograph."

While there are several forms of manograph at present on the market, yet they are all alike in general principles. A small concave mirror is so arranged that the motion of the piston of the engine or motor rocks it through a small horizontal angle, about 20 degrees; it will be readily seen that if a pencil of light be directed on this mirror and the motor turned over fast enough, that the motion of this spot of light will appear as a straight horizontal line if allowed to fall upon a screen. If, moreover, we employ a

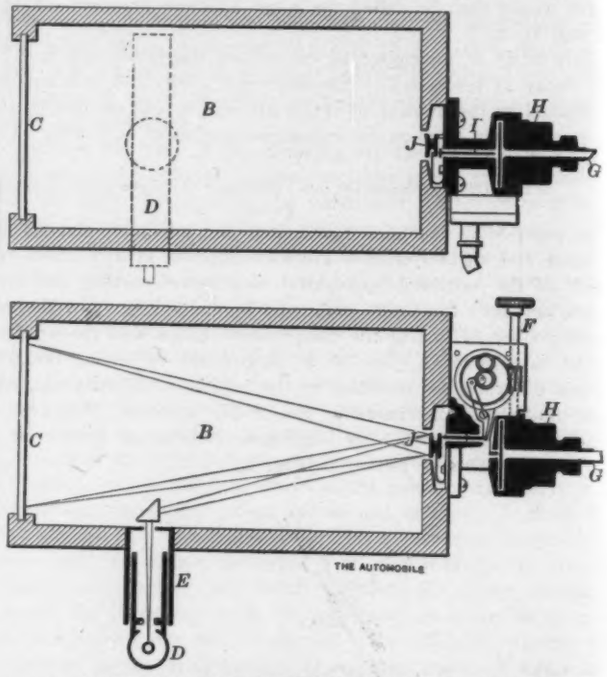


FIG. 7.—VERTICAL AND HORIZONTAL SECTIONS OF CARPENTIER MANOGRAPH.

Diagrammatic sketches showing the interior arrangement of parts. The upper sketch is the vertical section and the lower the horizontal section. Reference letters correspond to those employed in Fig. 6.

device in such a manner that we can rock the mirror through a vertical angle to correspond with the pressures in the motor cylinder, and if we connect this latter device with the cylinder of the motor, we shall have a diagram traced upon our screen in a continuous line of light. Furthermore, if we wish to make a permanent record of this diagram, it will be only necessary to substitute a sensitized plate or paper for our screen, and we shall then be able to record our diagram photographically.

The Schulze manograph was described at length in the July 5 issue of THE AUTOMOBILE, so it will not be necessary to consider it here. Another type which has attracted a good deal of notice abroad is the Carpentier, a general view of which is shown in Fig. 6. The casting *A*, in which is secured the mirror, together with both mechanisms which cause its motions, is fixed to the back of a light-tight box *B*, which is generally mounted on a tripod. A ground glass screen *C* is shown partially withdrawn from its position on the front of the box *A*. An ordinary photographic plate holder may be substituted for this screen in case a permanent record is required. A lamp *D* furnished with an acetylene burner communicates with the interior of the box *B* by means of the tube *E*.

The horizontal motion of the mirror is caused by a small crank and connecting rod, together with a reducing lever, which is mounted on *A*; this is actuated by a flexible shaft *e*, which is driven directly by the motor crankshaft, a special taper socket being applied to the crankshaft so that the flexible shaft may be readily connected or disconnected at will. Means are provided for adjusting the relation of the reducing motion, so that the motion of the beam of light and that of the piston shall correspond. This adjusting mechanism is operated by the screw *F*. The pipe *G* communicates with the explosion chamber of the motor on one side of a diaphragm, which is secured in place by

a nut *H*. A pin bears against the center of this diaphragm and also bears against the back of the small concave mirror.

Fig. 7 gives a vertical and horizontal section, showing the general arrangement of the apparatus; the upper or vertical section shows the operation of the diaphragm, which acts on the back of the mirror *J* by the pin *I*. The lower or horizontal section shows more clearly the action of the reciprocating and reducing motion.

It is very interesting to watch the diagram formed on the screen and to note the changes which take place in it as changes are made in the carbureter setting or the timing of the ignition. In fact, this feature gives to the manograph the same relative advantage over the ordinary form of indicator that the tachometer has over the ordinary revolution counter and stopwatch.

It will be readily seen that the manograph is much better adapted for obtaining high-speed diagrams than the ordinary forms of indicator, on account of the great reduction in the amount of motion and the weight of the moving parts, and also on account of the special reducing motion, which better adapts it

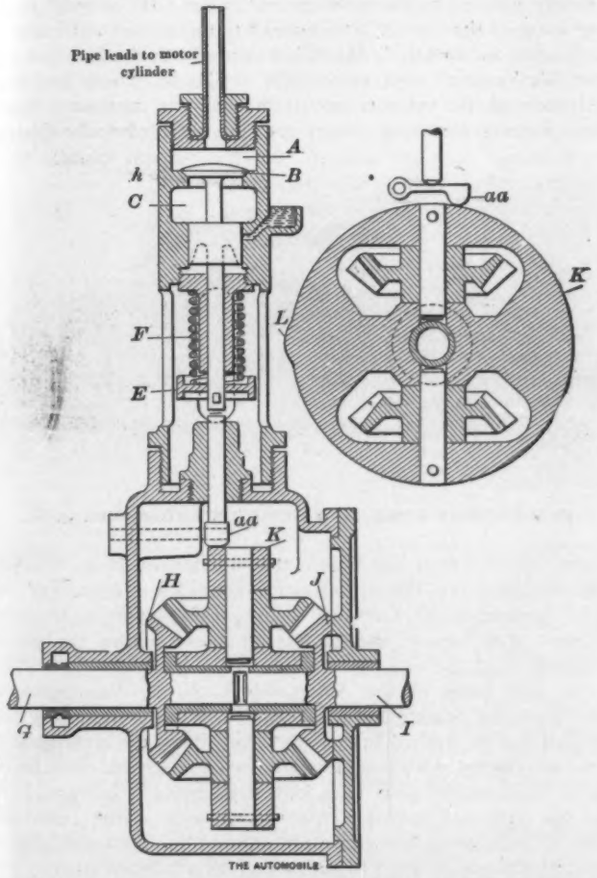


**FIG. 8.—SECTIONS OF DE DION-BOUTON INDICATOR SHOWING PRESSURE ADMISSION VALVE AND ACTUATING MECHANISM.**

Note, the reference letters correspond to those employed in Figs. 9 and 10.

to enclosed crankcase motors. Moreover, the error caused by the inertia of the moving parts is practically negligible.

The well-known house of De Dion-Bouton has devised a very novel form of indicator which is probably capable of securing good diagrams at any speed which it would be possible to run a motor, provided, however, that the pressures remain uniform during successive cycles. Granting this to be so, the operation of this device depends upon the following fact: If, during a small portion of each cycle of the motor we open a valve which will connect a small reservoir with the motor cylinder, as, per example, an indicator cylinder, the pressure in this reservoir or cylinder will tend to reach the average pressure in the motor cylinder during that portion of the cycle that the connecting valve remains open. Now, if this period during which the valve remains open be exceedingly short, the pressure indicated will practically be for a single point during the cycle, and, furthermore, if we obtain the pressure by this means from a number of successive points

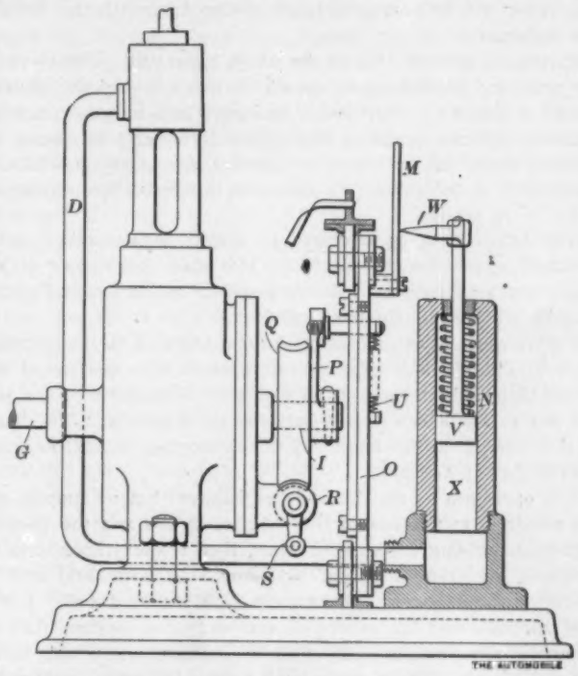


**FIG. 9.—SKETCH OF DE DION-BOUTON INDICATOR PARTLY IN SECTION**

Note, exterior of valve mechanism (shown in section in Fig. 8) on the left; reciprocating mechanism carrying indicator card in the center and indicator cylinder, in section, on the right. Reference letters correspond to those employed in Figs. 8 and 10.

during the cycle and plot these on a paper, we could readily construct a complete diagram by drawing a line through the points. This the De Dion-Bouton indicator does automatically.

Fig. 8 is a drawing of the valve and its actuating motion. A copper tube connects the explosion chamber of the motor with the space *A*. This space communicates through the valve port—controlled by the valve *B*—with the space *C*, from which a pipe (*D* in Fig. 9) leads to the indicator cylinder. This valve is of the poppet or mushroom type, but is balanced by the piston *E*, which piston also serves to keep the chamber *C* gas-tight. The valve is normally closed by the coiled spring *F*. The actuating mechanism is below the valve and is similar to a bevel differential; the shaft *G* and its bevel H are driven at the same speed as the motor shaft. The shaft *I* and its bevel *J* are held stationary normally; if this is the case the disk *K*, together with its cross bevels, will revolve just once to two revolutions of the shaft *G*, or the motor shaft. If, however, the shaft *I* is rotated more or less the position—during these two revolutions of the shaft *G*—at which the valve will be

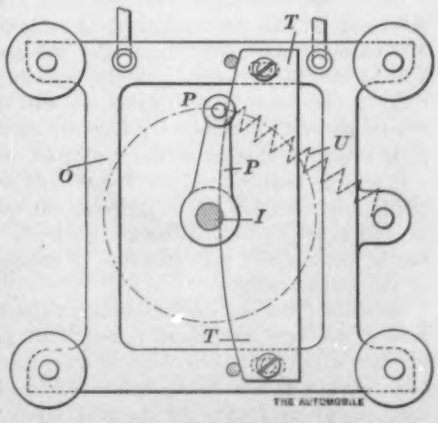


**FIG. 10.—RECIPROCATING MECHANISM OF DE DION BOUTON INDICATOR.**

Note, this is shown in position (end view) in Fig. 9. Reference letters correspond to those employed in Figs. 8 and 9.

opened by the cam *L* will be changed. If we so arrange matters that upon revolving *I* we reciprocate a paper or card on which a pencil connected to the indicator rests, as the time at which the cam *L* opens the valve *B* is changed, the position of the paper will be correspondingly changed beneath the pencil of the indicator.

Fig. 9 is a general view of the whole apparatus. The valve and its operating mechanism is shown on the left. In the center is shown a frame *O* which slides backward and forward on rollers in a plane perpendicular to that of the drawing. This frame carries the board *M*, to which is fastened the paper on which the diagram is to be drawn. To the right is shown the indicator cylinder *N* in section.

The frame *O* is reciprocated by means of a crank *P* and a crankpin attached to the shaft *I*. The shaft *I* is turned or kept stationary by means of a worm wheel *Q* and a worm *R*, which may be revolved by the hand crank *S*.

Fig. 10 gives a better idea of the operation of the reciprocating device. The pin *P* is kept in close contact with the curved edge of the plate *T* by means of the spring *U*. The curve of the plate *T* has a radius which should bear the same relation to the length of the crank *P* as the length of the connecting rod of the motor does to that of its crank.

The operation of the device is as follows: Let us suppose that the motor is at the end of the exhaust stroke and the cam (*L*, Fig. 8) is holding the valve *B* open, then if everything is in adjustment the crank *P* (Fig. 10) should be horizontal and the frame *O* should be to the extreme right of its travel. Let us now suppose that the motor is started; it is evident that the valve will always open under these conditions, just a little before the end of the exhaust stroke and close a little after that point; the result is that the pressure in the indicator piston will probably be the average during the period that the valve is open, or about atmospheric. Let us suppose that the motor is turning over very slowly and that just as the valve *B* opens we revolve the shaft *I* at the same speed as the shaft *G* but in an opposite direction, for, say, one revolution, the result is that the cam disk remains stationary and the cam *L* holds the valve open (see Fig. 8). The result of this action is that the piston of the indicator (*V*, Fig. 9) acts as an ordinary indicator piston would act and as the frame *O* is reciprocated the suction and compression lines are drawn. If, now, we hold the shaft *I* stationary, the cam will open the valve at the end of the compression stroke, and the result will be that the pressure shown by the indicator will be the average pressure during the portion of this stroke that the valve remains open. This action of the valve mechanism may be easily verified by experimenting with an ordinary differential gear, regarding the left axle, let us say, as shaft *G* and the right axle as the shaft *I*. and the gear-box as the cam disk *K*.

Let us, however, suppose that the shaft *I* is very slowly revolved, the result will be that the period of valve opening will be gradually changed and at the same time the position of the card *M* will be changed in relation to the indicator pencil (*W*, Fig. 9). Also the pressure in the cylinder *X* will gradually change, and the result of the combined movement of the pencil *W* and the plate *O* will be that an indicator diagram will be drawn upon *M*.

It will be readily seen that the velocity of the indicator piston can be kept very low, no matter what the speed of the motor may be, and as all the other parts are positively operated, no difficulty can be encountered with this type of indicator due to the inertia of the moving parts.

As neither the manograph nor De Dion type of indicator have been in use very long there is very little generally known as to the data which have been obtained from their use. Already, however, work with the manograph in this country gives promise of very interesting results for the near future.

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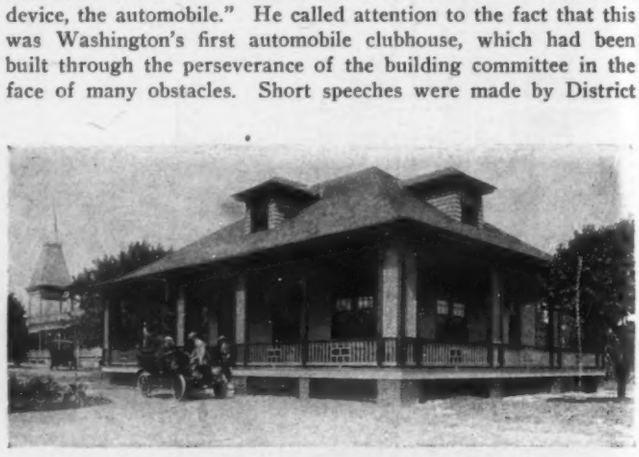
**Connecticut** claims to possess the oldest woman automobilist. She is Mrs. Elizabeth Hunt, of Brooklyn, that state, 106 years old, and is making a tour of the state.

## WASHINGTON A. C. COUNTRY HOUSE OPENED.

WASHINGTON, D. C., July 23.—The formal opening of the new country clubhouse of the Automobile Club, of Washington, occurred Tuesday evening, July 17, being attended by practically the entire membership of the club, together with the leading city officials and many ladies. The affair was the most brilliant in the history of local automobilism, and reflected great credit upon the club's officers, who were indefatigable in their efforts to make it pleasant for everyone. The procession of cars on the Brightwood road to the clubhouse seemed to be a never-ending stream, and caused the natives to sit up and take notice. Henceforth the Brightwood road will be Washington's great automobile thoroughfare. The spacious clubhouse was brilliantly illuminated with electric lights, the main room being banked with cut flowers and potted plants, while smilax and ferns were draped gracefully around the chandeliers.

After the guests had become thoroughly acquainted, President Duvall rapped for order, and in a neatly worded speech extended a hearty welcome to the members and guests. He referred to the new home of the club as "a monument to that useful and healthful device, the automobile." He called attention to the fact that this was Washington's first automobile clubhouse, which had been built through the perseverance of the building committee in the face of many obstacles. Short speeches were made by District



NEW COUNTRY HOME OF WASHINGTON AUTOMOBILE CLUB.

Commissioners West and Biddle, the city fathers, Judge Kimball, Superintendent of Police Sylvester, John Joy Edson, and the club's captain, R. B. Caverly. During the evening a bountiful collation was served, and it was midnight before the guests departed.

The new home of the Automobile Club, of Washington, is located on the Brightwood road, about four miles from the city, and can also be reached from Rock Creek Park, the great government reservation containing many miles of fine road. The building is built on the lines of a bungalow, being constructed of Georgia pine, and having a spacious veranda at the front and sides. The building has a frontage of sixty-five feet, with a large attic, which will be used in the winter as a billiard room. The main room is 20x36, opening into retiring rooms for ladies and gentlemen. The building is heated throughout by hot water and is lighted by electricity. The main room is equipped with furniture of the mission type, the walls being adorned with pictures of the last Vanderbilt cup race and other notable automobile events. A large colonial fireplace of red brick is a feature of this room. On the verandas are many fine pieces of wicker furniture that tend to give the house a most cozy and comfortable appearance. In the winter time the south veranda will be inclosed in glass and be turned into a sun parlor. The clubhouse is back some distance from the road, in the center of a beautiful lawn. Adjoining it is the home of the Villa Flora Club, at one time the home of the present club.

A meeting of the club was held Thursday evening, at which it was decided to increase the initiation fee to $50. Several other important matters were taken up, including the appointment of a house committee. The club was organized in October, 1905, and has about one hundred members.

# NEW YORK ROAD IMPROVEMENT IN SIGHT

By ROBERT BRUCE.

NEW highway construction, as a result of the $50,000,000 good roads amendment, carried by such a large majority less than a year ago, is already promising early and excellent results at very many points in New York state. The objection raised by the opponents of the measure when it was first discussed—that the politicians would get most of it—does not seem likely to be borne out in any way. Competitive contracts have already been awarded by the State Engineer and Surveyor's office, covering a surprisingly large number of items, well scattered through the state, and the work seems likely to be carried through on a thoroughly businesslike basis.

The completion of improvements already contracted for will prove of immense benefit to automobile touring, and will be the first step toward placing the Empire state on a footing with New Jersey and Massachusetts in respect to road-building measures. While the new mileage may be small in comparison with the total mileage of the state, the strategic location of most of the new lines means much more than appears on the surface. Among the new contracts are the following, the figures being taken from reports emanating from the Roads Department at Albany, names of contractors and all non-essential details omitted:

Birch Hill road, Nassau county ($10,172); Goodrich road, Erie county ($69,197); Frankfort-East Schuyler road, Herkimer county ($12,700); Mechanicville-Stillwater road, Saratoga county ($18,000); Saratoga-Schuylerville road, Saratoga county ($53,000); Johnstown-Keck Center road, Fulton county ($40,000); Plattsburg-Keeseville road, Clinton county ($36,000); Gulf Bridge road, Broome county ($14,406.28); Union-Maine road, Broome county ($30,604); Deposit road, Broome county ($26,474); Tunnel road, Broome county ($13,319); Castle Creek road, Broome county ($54,662); Bridge road, Broome county ($9,093); Maine road, Broome county ($32,202), and Barker road, Broome county ($6,290).

Aurora-Buffalo road, Erie county, Section 3 ($6,500); Grand Central avenue, Chemung county ($93,012); Owasso road, Cayuga county ($18,000); Sacket Harbor road, Jefferson county ($10,887); Saratoga-Corinth roads, Saratoga county ($46,887); Glenmont road, Albany county ($48,460); Old Plank road, Fulton county ($19,300); Plattsburg-Mooers road, set 12, Clinton county ($55,894); Plattsburg-Mooers road, set 3 ($33,000).

Adams-Henderson road, Jefferson county ($45,176); Henderson Harbor road, Jefferson county ($27,858); Floyd road, Oneida county ($26,750); Marcy road, Oneida county ($43,250); Deerfield road, Oneida county ($31,450); Utica-Oneida Castle road, Oneida county ($133,050); Kingston-Highland Falls road, Ulster county ($40,800); Brunswick turnpike, Rensselaer county ($25,747); Collimer road, Onondaga county ($18,000); Waterford-Cohoes road, Saratoga county ($21,138); Aurora-Buffalo road, Section 2, Erie county ($39,950); Troy-Sand Lake road, Section 2, Rensselaer county ($10,400).

Little Ridge road, Section 2, Monroe county ($23,600); Barnards Crossing, Monroe county ($34,900); Peekskill-Salem road, Section 1, Westchester county ($43,233); same road, Section 2, ($33,711); Reed's Corners road, Ontario county ($19,200); Orchard Park road, Section 2, Erie county ($12,000); Nassau road, Rensselaer county ($31,500); Gilbertsville road, Otsego county ($26,000); South Salina street, Onondaga county ($15,085); Cemetery road, Onondaga county ($8,400).

Griswold Street road, Niagara county ($17,000); Victor Menden road, Ontario county ($36,400); Averill Park road, Rensselaer county ($27,660); Minaville-Scotts Bush road, Montgomery county ($15,000); Woodbury-Central Valley road, Orange county ($18,367); Stockport-Hudson road, Columbia county ($23,100); West Lake road, Onondaga county ($9,350); East Lake road, Onondaga county ($8,730); Cincinnatus road, Cortland county ($3,650).

Redwood-Alexandria Bay road, Jefferson county ($29,790); Colliersville-Emmons road, Otsego county ($10,716); Shadyside-Otsego road, Otsego county ($19,967); Saratoga-Glens Falls road, Saratoga county ($8,513); Poland-Cold Brook road, Herkimer county ($3,740); Augusta road, Oneida county ($24,200); Saratoga-Ballston road, Saratoga county ($30,969); Geneva-Canandaigua road, Ontario county ($8,242); Lyons-Geneva road, Ontario county ($12,465).

Gloversville-Phelps road, Fulton county ($17,030); Lake Pleasant road, Hamilton county ($24,443); Post road, Ulster county ($52,250); Kingston-Ellenville road, Ulster county ($56,500); Gilbertsville Mountain-Upton road, Otsego county ($37,000); Colliersville-Milford road, Otsego county ($16,500); Schenevus-Maryland road, Otsego county ($34,400); Kingston-Ellenville road, Ulster county ($63,439); McGrawville road, Cortland county ($26,661).

### Where the Improvements Will Be Most Effective.

These ordinarily dry statistics will be interesting reading for any automobile tourist with fresh memories of trips in New York state, particularly in bad weather. In some instances the improvements will be in the nature of a regeneration, which is particularly true of Oneida county. This county, by the way, has the largest single contract of all, from Utica to Oneida Castle, which will give a magnificent state highway nearly half of the way between Utica and Syracuse, in place of the present old Seneca turnpike. With the improvements in process or in prospect on the Syracuse end, this middle portion of the Albany-Buffalo run will be in excellent condition, and automobile travel over it very much improved.

Among the other Oneida county improvements scheduled are the Deerfield road, the northward extension of Genesee street, Utica (which it is hoped will include that vile stretch across the Mohawk river "flats"), and a new link between East Schuyler and Frankfort, the latter partly in Herkimer county. These will materially assist tourists eastbound from Utica; and, taken in connection with an improved "Marcy road," the beginning of the principal outlet from Utica and the Mohawk Valley toward Boonville, Lowville and Watertown, will give Utica a much better place on the touring map than it has ever had before.

Saratoga county figures very largely in the award of contracts, as will be noted from the list; in fact, it would take a somewhat close study of the map to look up a direction in which the present course of improvement does not extend. This is exceedingly fortunate, for while the famous spa itself has good roads locally, those connecting it with the surrounding country are far from as good as usually supposed. But in the course of another year or so Saratoga will be the literal hub of good highways, connecting with the Hudson river (at Schuylerville, Stillwater, etc.), with the eastern Adirondacks (via Glens Falls and Caldwell, Corinth, etc.), as well as with Troy, Albany and Schenectady by a wide choice of routes. It is not improbable that the effect of this will be to multiply the popularity of Saratoga as a summer capital of autoing.

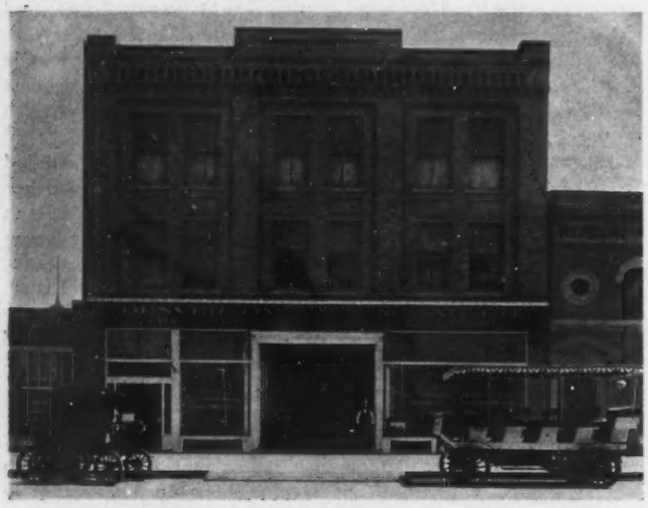
### Oneida and Saratoga Counties Benefited Chiefly.

A glance over the list will show a number of separate improvements as important as any given, but nowhere else such a grouping of good things as in Oneida and Saratoga counties. Both of the main routes from Troy east—the Brunswick turnpike, the chief exit toward northwestern Massachusetts and southern Vermont—and the Troy-Sand lake road—the chief exit toward Pittsfield—are on this list. So are also several new extensions of the state highway system between Watertown and the St. Lawrence, which is an excellent thing for prospective summer visitors into that charming country of lake and river. Another short stretch whose improvement will be noted with general interest is that between Hudson, N. Y., and Stockport, just above; this has always been a ticklish spot on all Poughkeepsie-Albany runs, and is usually dreaded by automobilists who are endeavoring to make good records.

Taken all in all, the prospect is better than many autoists would have thought possible even eighteen months ago. It is the beginning of a system of highways which shall be an adequate index to the population, wealth and enterprise of the Empire state. The time necessary to run an automobile from New York to Albany, Utica, Syracuse, Rochester or Buffalo, as well as to intermediate and neighboring points, is to be cut in two. The pleasure of making the choice of a hundred trips is to be doubled, while the better road conditions will largely reduce the expense per mile. Who, from this or any other point of view, will question the wisdom of the $50,000,000 amendment of 1905? Certainly not automobilists or other habitual users of the highways.

## AN ELECTRIC GARAGE AT DENVER.

It speaks well for the popularity of the electrically-driven automobile in the West that a large and complete garage, devoted exclusively to the care and storage of electric cars, has been opened in Denver, Col., by the Denver Omnibus and Cab Company. The general appearance of the exterior and part of the



EXTERIOR OF THE DENVER OMNIBUS & CAB CO. GARAGE.

interior of this garage is shown in the accompanying engravings. The building is well located at 1508-12 Cleveland avenue, and is fitted up with every facility for caring for cars. The charging plant is particularly well arranged. There is a switchboard from which twenty-four cars can be charged simultaneously; charging current is generated by direct current machines, and these machines are in duplicate, so that in case of the disablement of one the other will be available. And in case of the disablement of both generators the alternating current from the street mains can be brought in and passed through a mercury arc rectifier—an apparatus for converting an alternating current, which cannot be used for charging storage batteries, to a direct current, which alone can be used for this purpose. Thus the possibility of being without charging current is very remote.

Storage batteries are heavy and difficult to handle without appropriate machinery. For this purpose a portable crane has been installed, enabling the men to move batteries around the garage

BIG DISPLAY OF ELECTRIC VEHICLES INSIDE THE DOOR.

without difficulty, regardless of their great weight. A hydraulic hoist has been installed for lifting batteries into vehicles. An electric elevator runs from the basement to the ground floor.

The battery repair department has been fitted with all the requisite appliances for handling all kinds of battery work, and is in charge of a foreman who is an expert in his line. For mechanical repair work a lathe and drill press have been installed.

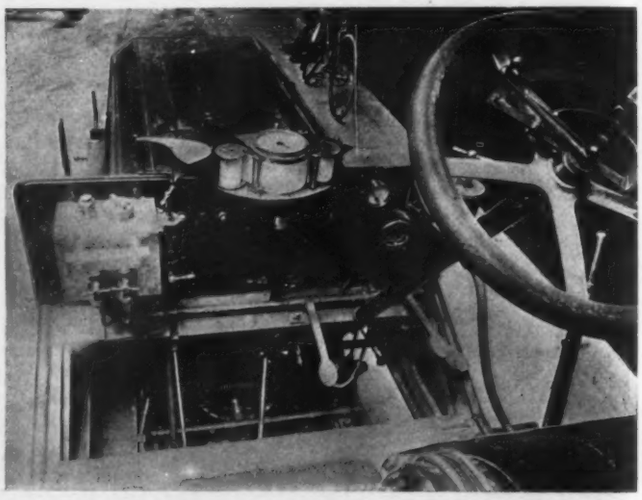
The space devoted to the storage of cars is entirely separate from the repair department. Steam heat is installed throughout the building and batteries will not be allowed to suffer from the temporarily deteriorating effects of low temperatures in winter. There will be a night force on duty, so that customers can have their cars charged, get in and out or have repairs made at any hour of the day or night—often a great convenience, especially to physicians and others whose cars are used in the course of business.

A very modern idea is the installation of a compressed air system for cleaning the cushions and other upholstered work of cars. This not only results in the thorough cleaning of the coverings but also saves the wear and tear that inevitably follows the vigorous use of the brush—an important matter, from the customer's point of view.

The Denver Omnibus and Cab Company has been appointed local agent for the Exide storage battery, and a full stock of battery parts is kept on hand. The company operates a line of sight-seeing brakes in Denver, making several daily trips about the various interesting portions of the city.

## INSTRUMENT THAT WON ROTHSCHILD PRIZE.

Henri de Rothschild, of Paris, recently offered a cash prize for an accurate speed and distance indicator, to be placed conspicuously on the dashboard of the car, before the eyes of the driver. A competition was organized for a distance of 100 kilometers on the famous road of Montgeron, near Paris. Thirteen apparatus were fitted on fast motor cars of different makes. The Krauss speedometer, technically designed by the name of odotachimeter, was awarded the prize for best results obtained under the conditions imposed by the test.



THE ODOTACHIMETER IN POSITION FOR SERVICE.

The system roughly consists of a small disk-pulley, fitted on the internal side of the right front wheel, around the hub, and on which runs a fine wire string. That string reaches the apparatus on the board of the car, through other flat disk-pulleys of the same size, horizontal and vertical, placed at prominent angles on the chassis and on the board. In the odotachimeter itself a special clock movement has been fitted, with which, simultaneously, the wire, actioned by the wheels in motion, causes a band of paper to move and be marked by a handle which draws exactly the configuration of the road, and also indicates the distances by passing vertical lines printed and numbered in hectometers and kilometers. A second part of the movement indicates the corresponding speed through fingers, as in ordinary types of speed indicators.

# DILIGENT DOINGS OF THE AUTO CLUB MEN

### Minneapolis to Have an Economy Test, July 28.

MINNEAPOLIS, MINN., July 21.—An economy run, a new feature for Minneapolis automobilists, is being arranged for Saturday, July 28, by the Minneapolis Automobile Club, and is expected to prove one of the most interesting features of the automobile season. Figuring that a 3,000-pound automobile should consume twice as much gasoline as a 1,500-pound machine in covering the same distance, the officials, with a gallon of fuel as a standard, will allot each machine a certain amount of gasoline. The start will be made at the Automobile club and the machines will run toward Minnetonka, the car which runs the longest distance on the allotted fuel being declared the winner.

A floral automobile parade will be given by the Minneapolis Automobile Club during G. A. R. week in August. This was decided on at the last regular meeting of the club, at which time eighteen new candidates for membership were admitted, and $150 was appropriated for repairing some bad places in Superior boulevard, the work to be done under the direction of G. A. Will, chairman of the Good Roads Association.

### Hoosiers Lay Cornerstone of New Clubhouse.

INDIANAPOLIS, IND., July 23.—The laying of the cornerstone of the Indiana Motor Clubhouse, at Broad Ripple, was one of the most important occasions in the history of local motordom. It is expected that the clubhouse will be ready for occupancy within the next month. The Indiana Motor Club was organized during the spring, and now has more than two hundred members, numbering the more prominent automobile owners of the city, together with owners of motor boats. When the clubhouse is completed, it is planned to have an old-fashioned house-warming.

Probably three hundred persons interested in automobiling and motor boating attended the cornerstone laying to-day. There was an address by Mayor Charles A. Bookwalter, who is himself a motor enthusiast. The clubhouse, when completed, will represent an expenditure of more than $4,000, and will occupy a site with a frontage of 400 feet on White river.

### New Jersey A. and M. C. Race Meet, August 4.

NEWARK, July 24.—The first race meet of the season under the auspices of the New Jersey Automobile and Motor Club will take place Saturday, August 4, at Weequahic Park, Waverly. This event was postponed from July 4, as the committee could not obtain the park track for that date. Greater things are predicted for the coming event, and it is hinted that this affair will eclipse all previous racing events in the club's history. The board of trustees of the club, at a recent meeting, decided that two or three race meets should be held this season. The large attendance that have witnessed the previous meeting held by the club has encouraged this form of sport, and these events are regularly looked for.

The club will give a dinner and theater party in the near future at Olympic Park. The latter resort is near by—a short run.

Contracts have been signed for the alterations for the new clubhouse, the Osborne mansion on Broad street, corner of Chestnut, which was recently leased by the club for a term of years. Many improvements will be made in the mansion to make it an acceptable home for automobilists. Work will be pushed steadily on the alterations, and it is expected that the house will be ready for occupancy the early part of September, or sooner.

### Rochester Automobile Club's Successful Gymkhana.

ROCHESTER, N. Y., July 23.—One of the leading features of the recent gymkhana sports, held by the Rochester Automobile Club, and the results of which were chronicled in THE AUTOMOBILE last week, was the obstacle race. As will be seen by the illustration on this page, this event provides unlimited possibilities for skilful driving and pure, unalloyed fun. A large number of barrels, dummies, and other like objects, were arranged on the 125-yard course, at all sorts of angles, but with sufficient space between them to carefully drive a car. The contestants in this event were obliged to drive their cars through them without touching any of the objects, and reach the finish line in the best time possible. The gymkhana was run in connection with the annual field day

AT ROCHESTER A. C. GYMKHANA—GAMES, H. G. STRONG IN HIS ROYAL TOURIST FINDS ONE BARREL TOO MANY.

at Genesee Valley Park, on the large meadow beyond the refectory, a course of 700 by 300 feet having been carefully mowed and rolled for the occasion. The committee, to whom the success of the affair was due, consisted of Henry G. Strong, Austin Crittenden, Joseph J. Mandery, Robert Thompson, and John S. Bingeman.

President Harry Woodworth, of the Rochester Automobile Club, it is said, will shortly call a meeting of the association to discuss the matter of subscriptions to a fund for the paving of Elmwood avenue, an avenue much used by autoists. This road is in the town of Brighton, which lacks money to pay for the improvement. Property owners sent in a request that owners of automobiles who use that section should help pay for the paving.

### Clevelanders Preparing an Ohio Guide Book.

CLEVELAND, July 23.—A great aid for tourists instigated by the Cleveland Automobile Club is a new guide book. This has been in course of preparation for many months, and is now on the press, and will be distributed to members and others within a week or so. The book covers the roads in Ohio quite thoroughly, giving maps of the different districts and thorough reports as to the conditions of the roads, stopping places, etc. It also shows the main routes from Cleveland to Chicago, Detroit, Indianapolis, Buffalo, Pittsburg and numerous other large cities in adjoining states.

The amount of touring through Cleveland and from Cleveland is proving heavier than ever before, and Secretary Goddard spends a good portion of his time in supplying information as to routes and automobile laws in other states. His office is well supplied with tourists' maps and literature relating to tours, and as Mr. Goddard himself is a tourist of widespread experience, and as he has a wide acquaintance among automobilists all over the country, his advice is constantly sought for; so that the work which he is doing redounds greatly to the credit of the organization, and is giving it the reputation of being one of the strongest and most enterprising organizations of the kind in the country.

### Canadians Talk of Forming Provincial Associations.

TORONTO, ONT., July 21.—The executive officers of the Toronto Automobile Club are considering a movement to organize all the automobilists of the Province of Ontario into a provincial association, the object of which is to secure more favorable legislation, and to look after the common interest and welfare of the autoing fraternity.

At the late session of the Provincial legislature, a fierce battle was fought against the enemies of the automobile, with a result not altogether satisfactory to the automobilists themselves, as a rather drastic measure, taking effect July 1, was passed. The burden of the protection of motoring interests fell wholly upon the Toronto Automobile Club, and devolved upon a few individuals, who worked nobly for the cause, and sacrificed much time from their businesses to attend the hearings.

A provincial association, composed of local clubs, organized on the plan of the American Automobile Association, can wield a powerful influence in legislation here, and the early fall promises to see such an organization perfected.

### York Autoists Plan Endurance Run and Orphans Day.

YORK, PA., July 23.—Still in its infancy, but with a great future promised, the York Automobile Club, with its membership of about one hundred, is arranging a series of fall events that are sure to attract autoists from all parts of the state. The first and most important event is the endurance run, which is scheduled to take place early in September. Another important feature in connection with the fall events will be the "Orphans Day" celebration, when hundreds of orphans will be taken on a trip along the Susquehanna river to spend the day. This latter event will take place in October. While the members are busy arranging the details for these affairs, they are not overlooking the fight for good roads. There has been some improvement through this part of the state, but the local club hopes to have much more accomplished within the near future.

## CLUB DOINGS IN GENERAL.

GRAND RAPIDS, MICH.—Arrangements are being made by the Grand Rapids Automobile Club to secure a country clubhouse at Cascade Springs, ten miles north of this city. A hotel will be leased for the purpose.

TRENTON, N. J.—Wilbur F. Sadler, secretary of the New Jersey Automobile Association, has returned to this city after an extended trip on Long Island in his automobile. Mr. Sadler is a prominent member of the Mercer County Automobile Association.

DULUTH, MINN.—Annual automobile day has been set for August 4 of each year by the Duluth Automobile Club, which will inaugurate the occasion with a big parade on that day, in which all the automobilists of Duluth and Superior will be invited to participate. The parade will be formed at 4 o'clock in the afternoon and will terminate with a banquet in the evening.

MOBILE, ALA.—Plans are being perfected for the organization of an automobile club here, and at a meeting recently held at the rooms of the Commercial Club, a committee on organization and membership was appointed, consisting of A. D. Bloch, N. A. Richards, Capt. W. F. Tebbets, J. T. Flock, A. J. Spencer, Guy Hartwell, and A. L. Gould. Mr. Bloch presided as temporary chairman, and J. A. Mahon as secretary.

PHILADELPHIA.—As a result of the enterprise of the Automobile Club, of Philadelphia, all the main roads in Springfield township, Montgomery county, just across the city line, have been decorated with signs warning automobilists to sound the horns on approaching all road crossings. The Springfield township officials have been making a good thing of it arresting automobile operators who failed to observe this regulation on each and every occasion.

MANKATO, MINN.—Starting with a charter membership of 29, the Mankato Automobile Club has been organized in this city with the following board of officers: President, H. A. Patterson; vice-president, R. E. Brown; secretary, G. A. Lewis; treasurer, B. Bangerter, Jr.; directors, G. M. Palmer, A. R. Pfau, Sr., and C. H. Saulspaugh. The club will be incorporated under the Minnesota laws.

PROVIDENCE, R. I.—At the last meeting of the board of governors of the Rhode Island Automobile Club, the resignation of Howard D. Wilcox as chairman of the runs and tours committee was received. Everett F. Boyden was elected to the committee vacancy and a new chairman will be elected later. Mr. Wilcox has served on the committee for the past five years and resigned because his duties as treasurer of the club keep his time fully occupied. Five new members were elected to the club and Col. Frank W. Tillinghast was nominated as the club's representative on the A. A. A. highways committee.

KANSAS CITY, MO.—At the annual meeting of the Kansas City Automobile Club, held last week, the following officers were elected for the ensuing year: President, W. W. Cowen; first vice-president, H. C. Blakeley; second vice-president, I. E. Bernheimer; secretary and treasurer, E. J. McNamara; directors, Dr. E. M. Hetherington, F. H. Thwing, G. H. Davis, L. C. Boyle, B. E. Nace, B. J. Fradenburg and W. G. Coombs. The club's finances were reported to be in excellent shape, and the membership is increasing rapidly. The club is considering holding a big touring event in the near future and a race meet early in the fall.

A CORNER OF THE DINING ROOM.

THE PARLOR IS A MODEL OF NEATNESS.

COMFORTABLE AND AIRY BEDROOM.

## AN ENERGETIC NEW ENGLAND CLUB.

The history of the Bay State Automobile Association, the opening of whose handsome new clubhouse in Boston was described in detail in last week's issue of THE AUTOMOBILE, is an integral part of the history of the struggle of Massachusetts automobilists for just and reasonable legislation. The association was formed early in 1905, when the prospect of a large crop of adverse legislation caused a general uneasiness among automobilists and a desire to enlist the services and co-operation of all who could put their shoulders to the wheel and push vigorously in the interests of the automobile in the Bay State.

Geo. W. McNear. James Fortescue. W. T. Helfer.

THE EFFICIENT HOUSE COMMITTEE.

Organized on broad lines, the Bay State Automobile Association has room for all classes of automobilists, whether manufacturers, dealers, or merely users, and is essentially an active body, ever on the alert to seize opportunities for preventing the passage of unfair legislation and encouraging the framing of proper laws. In fact, the association's energies are, in a large measure, devoted to legal work, and no little success has attended its efforts. Anything different could hardly be expected, in view of the avowed desire of the club to consolidate in a single body the largest possible number of the most active and able automobilists, all pulling together, all with one object in view. Every member is an active member, and when action is necessary the whole strength of the organization is promptly concentrated upon the work to be done and not relaxed until the work has been carried through.

EXTERIOR VIEW OF BAY STATE A. A. CLUB HOUSE.

When the club was first organized its headquarters were established at the Hotel Lenox, Boston, in the heart of the automobile district, and formed a most convenient meeting place for members. Its attractiveness as a meeting place was greatly enhanced by the fact that one of the rooms was a dining room for members, where a special service from the hotel dining room was arranged for, at special rates. This brought many members together, and the club dining room was the scene of many a warmly-contested argument concerning automobile matters—arguments that, though carried on with the utmost vigor and warmth, never went beyond the bounds of good humor. Live automobile matters were handled without gloves, needless to say, to the benefit of all concerned. Three months after the association was launched there were more than two hundred members, and the number has increased constantly ever since, until the present strength of six hundred has been reached. Last December the club headquarters was moved to the Woodland Park Hotel, at Auburndale, where the entire hotel annex was occupied. This housed the association most comfortably, while arrangements for a place of its own were in progress.

THE SIR THOMAS DEWAR TROPHY.

Lewis R. Speare has been president of the association since its organization, and is one of its hardest-working members, well backed by his fellow-officers. Perhaps the busiest of all the club members during the last few months have been the members of the house committee, James Fortescue, George W. McNear and W. T. Helfer. The club's new quarters are in themselves a sufficient indication of what their work has been, and the thanks tendered them on the occasion of the opening of the clubhouse were genuine on the one hand, and well deserved on the other.

THE AUTOMOBILE

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***The A. A. A. Tour Nears Its Terminal Point*** During the past week the A. A. A. tourists, who are contesting for the Glidden and Deming trophies, have been in the land of the Maple Leaf, and our Canadian cousins have received them with cordial hospitality, making their stay a pleasant one on the other side of the border. Tuesday marked their return to this country by the way of the pine-clad hills of Maine, and the end of the week will witness the finish of the tour at Bretton Woods.

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***While Dust Is Uppermost in the Autoist's Mind.*** Apropos of the dust question on the public highways, which seems to be a live topic these days, it is given out upon government authority that the automobile is destroying the roads, because of its dust-raising propensities. If the question is asked how this result is possible the answer is—by carrying off the dust, which, strange as it may seem, is considered to be the life of the road, and without which the roadbed soon undergoes disintegration. It is the cementing material of the surface which, combined with moisture, holds together the stony particles of the base. It is clearly, then, the duty of our road experts to immediately devise a satisfactory means of dust prevention, not only for the sake of the inconvenience it causes, but for the benefit of the roadbed itself. The problem of the future highway must be worked out by experiments on the present, and now is the time to begin. It is a question of vital interest to every automobilist, and whether it be crude oil, tar or some of the compounds that will solve the problem all road users will hail as a deliverer the genius whose process is efficacious and will stand the test of time.

***Automobiles and Real Estate Development.*** An interesting phase of the increasing popularity of the automobile is the effect it is having on the development of property in the suburbs of our cities. Places fortunately situated, and blessed with healthful surroundings, which formerly were undesirable because of their inaccessibility, are rapidly developing, according to the leading real estate authorities, who are free to admit that they mention the automobile as the means of transportation, when soliciting the patronage of the purchaser. It is not alone, however, with the very wealthy that the argument holds good. Numbers of people with moderate-sized incomes are reported to be buying outside sites for homes, and expending the money they save on their lots in the purchase of cars with which to make the journey to their places of business. If a person can secure for, say, $2,000 a lot in the suburbs that would cost him $4,000 farther in town, the money saved can find no better investment than in an automobile, which can be used practically all the year round, and which will furnish an independent and pleasant means of transportation to and from his newly acquired domain.

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***The Importance of Lubrication.*** Most club members or garage proprietors can recall instances of striking differences in the wearing qualities of cars of exactly the same model in the hands of different owners. One autoist will get satisfactory service throughout an entire season of continual use of a car, while another in the same neighborhood, using his car less frequently, perhaps, will have frequent trouble and have to pay considerable sums for replacements and repairs. Usually the owner who has the bills to pay blames the manufacturer of the car, and never thinks that he himself is largely responsible for the difference in car and tire efficiency and durability.

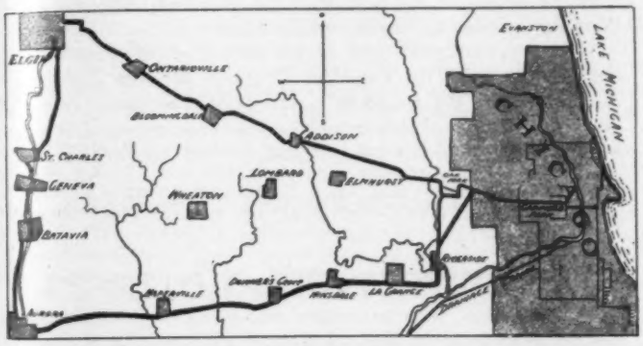
If any one thing more than another causes unsatisfactory service, it is imperfect lubrication. This is the case with many of the so-called careful drivers, who, having consideration for the car in not slamming it over all sorts of roads at high speed, cannot understand why the machine deteriorates rapidly. Often their education in the use of machinery has been confined to the maintenance and use of a horse-drawn carriage, in which an occasional greasing of the axles is sufficient, and they do not realize that the modern automobile is really a road locomotive, rather than a horseless vehicle. Troubles with ignition or gears, or with carburation, for example, are attended to in season, because they are immediately manifested when the car is put in motion, whereas there is often no easily recognized symptom of defective lubrication. A seized piston or bearing is warning enough to the most inexperienced, but great damage may be done to mechanism that has just sufficient lubrication to keep it from seizing, but not enough to prevent destructive wear. Badly worn bearings means that the moving parts get out of line and the whole machine slides down the decline of inefficiency to the repair shop.

Scrupulous attention should be given to lubrication to see that there is always an adequate supply of oil or grease in the proper receptacles, and that it gets to the point to be lubricated. Too liberal lubrication is merely wasteful, too little is destructive, and lubricants are cheaper than new machined parts of steel or iron. It is well to follow the example of the horsemen and attend to the needs of a car after finishing a run. Fill up the reservoirs so that a little forgetfulness before starting out will not end in a big repair bill. Often an owner will start out with nearly empty lubricators for "just a little run downtown," and will later find something unexpected to do, and the little run will extend into a considerable journey without adequate supplies on board. Unless in a great emergency neither a locomotive nor a steam vessel is sent out on a trip, however short, without complete supplies on board. The engineers in charge have learned by long experience not to take unnecessary chances.

Great damage to tires is caused by attempting to straighten out too quickly when turning a corner. As large an arc as possible should be described and this implies reasonable speed.

## CHICAGO'S BIG RELIABILITY CONTEST.

CHICAGO, July 23.—The chief interest of Chicago automobilists at present is directed toward the first annual reliability contest which is to be given jointly by the Chicago Automobile Club and the Chicago Automobile Trade Association Thursday, July 26, over the Elgin-Aurora course. Up to date there are 39 entries for the event, and it is expected by the committee in charge that between 70 and 90 will make the run. The complete course lies as follows: Line-up at Hubbard court and Michigan avenue, from thence out Jackson boulevard to Ashland, to Washington through Austin, to Oak Park via Washington boulevard, to Madison street, to Fourteenth street, to St. Charles avenue, and thence over the old cycle path, formerly used by bicyclists in making century runs, through Addison, Bloomingdale and Ontarioville to Elgin, where the first control will be placed. The entire distance so far is forty miles, and two hours and thirty




ELGIN-AURORA COURSE OF THE CHICAGO RELIABILITY RUN.

minutes are allowed for the distance. From Elgin the motorists will ascend the watch tower hill, and then follow the Fox river road through St. Charles, Geneva and Batavia to Aurora, the second control, which will be the turning point. The return course extends through Naperville, Downer's Grove, Hinsdale, La Grange and Riverside. From thence to Washington boulevard by way of Ashland boulevard and back again. This will occupy three hours. The entire trip is scheduled for seven hours and thirty minutes, with fifteen-minute stops at the two controls. Four cups will be awarded, one for each class. The following officials have been selected for the contest:

Referee—F. C. Donald, Chicago Automobile Club.

Starter—Charles P. Root.

Judges—J. W. Hayden, K. Franklin Peterson, R. W. Spangler, G. G. Greenburg and W. H. Arthur.

Timers—David Beecroft, Charles W. Mead, Percy P. Platt, Dr. C. S. Chapin and Ludwig Wolf.

Chief of checkers—Richard Bacon.

Control Committee—Elgin, L. B. Garrison and H. Wood; Aurora, Frank Anderson, L. H. Brunemeyer and W. J. Reed.

## LAW VIOLATORS JAILED IN PHILADELPHIA.

PHILADELPHIA, July 23.—Consternation was spread through the ranks of local automobilists last week by the announcement of Sheldon Potter, Director of Public Safety, that hereafter violators of the speed ordinance will be taken to the nearest station house and locked up pending the disposition of their cases. The Director hopes by this radical method to put an instant stop to the scorching practice, which, he avers, has been responsible for no less than four deaths here since the first of the month.

That the remedy is proving efficacious is evidenced by a glance at the blotters at the Central Station and other precinct houses, "fast driving" being the charge in at least half a dozen instances each day since the ruling went into effect. In each instance, despite the culprit's objection, he was taken to the station house and kept in durance vile until the Magistrate heard his case and accepted bail for his appearance.

## PREPARING FOR THE PARIS SALON.

PARIS, July 17.—Arrangements for the Paris Automobile Salon in December next are already being made by the organizing committee. The Grand Palais, in which recent shows have been held, is admittedly too small for all the exhibitors clamoring for space, but presents so many advantages in central position and architectural beauty that the management prefer to accept it and accommodate the overflow in a separate building. The Serres, on the banks of the river, have generally been employed for this purpose, but next December the annex will be on the Esplanade des Invalides, a huge plot of land separated from the main palace only by the Alexandre III bridge. Here temporary buildings will be erected, and as space is practically unlimited, the show is likely to be the largest ever held in Paris. The new site will enable the managers to make a much finer spectacular display than was ever possible before. The two buildings, the handsome Grand Palais on the right bank, the temporary buildings on the left bank, with the elegant bridge between them, will be united by festoons and triumphal arches, illuminated at night by myriads of electric lights. External display has always been a strong feature of Paris Salons—this year it will be more important than ever.

Each year some useful competition is held while the Salon is in progress in order to show what the brilliant-looking cars can perform in active service. This year's competition will consist of a mid-winter run from Paris to the south of France and back, probably to Nice or Biarritz. All classes of touring vehicles will be provided for and their return to Paris will be timed for early in the first week of the show. Taking place at a time when everybody is talking automobiles, enormous publicity will be given to the tour, and not only will the competition benefit individually but the industry as a whole will reap a rich reward.

## GOVERNMENT TO MAKE ALCOHOL TESTS.

An interesting result of the decision to remove the internal revenue tax on denaturized alcohol is that the Department of Agriculture has determined to institute a series of experiments for the purpose of obtaining all the information that can be secured regarding the use of alcohol as fuel for internal-combustion engines. Professor Charles E. Lucke has been retained by the department to direct the investigation, and the work will be carried on at the Columbia University laboratories. The result of the investigation, together with all other available information on the subject, will be published in an official bulletin and issued on January 1, 1907, when the new alcohol law goes into effect. Professor Lucke would be glad to hear from anyone who can give any information on this interesting subject, and will test any apparatus designed for using alcohol, such as carbureters, complete engines, parts, and so on. Tests will be made without expense to those loaning apparatus, they being asked only to pay for transportation to the laboratory. Apparatus will be returned and due credit given after the work is completed. In view of the importance of the subject—an importance which increases as the price of gasoline rises—it would be well for all who are interested to co-operate with Professor Lucke as far as possible.

## MR. MORRELL TAKES A CHAIRMANSHIP.

One of the best appointments just announced by President O. A. Quayle, of the New York State Automobile Association, is the selection of Robert Lee Morrell, of the Automobile Club of America, as chairman of the Good Roads Committee of the State organization. Mr. Morrell's chairmanship of the National Racing Board last year somewhat obscured the fact that he is a persistent good roads advocate, and last fall he engineered the good roads tour of the joint committee of the New York State Legislature. It is being planned by the directors of the New York State Association to have a tour this fall in the interests of the growing good roads movement, and President Quayle and Chairman Morrell will arrange the details in the near future.

## TWO-DAY RACE MEET AT DETROIT.

DETROIT, MICH., July 23.—Two records were broken on the first day of the two days' race meet at the State Fair Grounds here last Friday and Saturday. Barney Oldfield, driving the Peerless *Green Dragon*, made a mile with flying start in 56 seconds, reducing the previous record by a fifth of a second, and C. A. Coey, driving a Thomas stock car, covered the tenth mile of the 50-mile race in 1:08, breaking the mile record for stock touring cars. Webb, Burman, Oldfield, Coey, Albert and Freeberg furnished good sport for the spectators, but did nothing sensational. Following are the summaries for the first day's racing:

FIVE MILES, TOURING CARS, COSTING $1,000 TO $2,000.

1. Mitchell; driver, J. W. Bate. Time, 7:12.
2. Buick; driver, Crankshaw.
3. Jackson; driver, E. Schaifler.
4. Mitchell; driver, Rogers.

FIVE MILES, TOURING CARS, COSTING $2,000 TO $3,000.

1. Mitchell; driver, Rogers. Time, 6:49.
2. Buick; driver, Crankshaw.
3. Queen; driver, T. Woodcock.

FIVE MILES HANDICAP OPEN TO ALL CLASSES.

1. Premier racer; driver, A. C. Webb (scratch). Time, 5:36 1-4.
2. Thomas; driver, C. A. Coey (30 seconds).
3. Jackson: driver, E. Schaifler (135 seconds).

GREAT MOTOR DERBY, FIFTY MILES.

1. Jackson; driver, Burman. Time, 1:04:43.
2. Thomas; driver, Coey. Time, 1:07.

The events of the second day resulted as follows:

FIVE MILES, TOURING CARS, COSTING $2,000 AND LESS.

1. Mitchell; driver, Rogers. Time, 5:36 1-5.
2. Mitchell; driver, Zerbes.
3. Jackson; driver, Schaifler.

FIVE MILES, TOURING CARS, COSTING $2,000 AND MORE.

1. Jackson; B. Burman. Time, 5:36 1-5.
2. Mitchell; driver, Rogers.
3. Pungs-Finch; driver, T. Finch.

STATE FAIR HANDICAP, FIVE MILES, OPEN.

1. Thomas Tornado; driver, C. A. Coey (3 seconds).
2. Buick Space Eater; driver, Freeberg (12 seconds).
3. Pungs-Finch; driver, T. Finch (1 minute, 15 seconds).

WOLVERINE SWEEPSTAKES.

1. Green Dragon; driver, Oldfield. Time, 5:11 1-5.
2. Premier racer; driver, Webb.

FIFTY MILES, OPEN TO CARS OF ALL CLASSES.

1. Mitchell; driver, Rogers. Time, 1:05:02.
3. Mitchell; driver, Zerbes.
3. Queen; driver, Corey.
4. Pungs-Finch; driver, T. Finch.

## INDIANA'S TOLL ROADS MUST GO.

INDIANAPOLIS, IND., July 16.—From many sections of Indiana comes the news that automobile owners are preparing to wage war against the few remaining toll roads in Indiana. The fight will be carried to the floor of the state legislature in January and considerable pressure will be brought to bear to have this last relic of pioneer days abolished. Indiana's toll roads exist in some of the sparsely settled counties in the southern part of the state where ground is said to be so poor that even a disturbance can't be raised—except where automobiles are concerned. The taxes are not sufficient to keep roads in such localities in good shape, hence the toll.

If the tolls were reasonable, there would be little objection, but those in charge of the roads have been quick to take advantage of automobile drivers. In some places as high as five cents a mile is charged for automobiles, while horse-drawn vehicles are permitted to use the same roads for about one-third of the amount. As a counter plan for the toll roads, automobile drivers will propose a uniform system of road making under state jurisdiction. This, it is declared, would assure a uniform system of roadways throughout Indiana, something that is much needed, as the present system, or lack of system, to be more literal, has become intolerable and an insufferable burden.

## A. A. A. BLUE BOOK—WESTERN EDITION.

The pronounced success of THE AUTOMOBILE OFFICIAL A. A. A. BLUE BOOK FOR 1906, published by The Class Journal Company, publishers of THE AUTOMOBILE, early this year, has led to the decision to issue also a Western edition of this volume for 1907. Every facility will be utilized, and no time or expense spared, to make the new Western volume as complete and satisfactory in every way as possible.

The same staff that compiled and illustrated the present Blue Book will have the Western volume in charge, assuring a uniformity of style and treatment for the two, which we are sure will be appreciated by tourists and the automobile public generally. The work upon the new volume is already in process, and as the territory as a whole is less well known than the Eastern territory, the Blue Book would be very glad to correspond with proprietors of garages and individual autoists who have made, or expect to make, trips in the states of Ohio, Michigan, Wisconsin, Indiana, Illinois and Kentucky.

At some points, too, our routes will enter Minnesota, Iowa and Missouri, also the Canadian Peninsula between Detroit and Niagara Falls. We would be especially glad to secure copies of any itineraries issued by automobile clubs or garages, all of which will assist us to secure a broad and detailed information of the sections proposed to be covered.

Address The Automobile Blue Book, Flatiron Building, New York.

## ROAD IMPROVEMENT AT PITTSBURG.

PITTSBURG, PA., July 23.—After two years of incessant agitation the automobile interests of Greater Pittsburg, headed by Dr. John A. Hawkins, have succeeded in getting the Bryant boulevard tarred. The tar in a liquid state is poured over the surface of the roadway and upon it are thrown screenings of sifted gravel. This makes the roadbed solid and the top heedless of the rain that formerly plowed furrows in the boulevard as well as of the wind that has been hitherto a menace to the autoists by driving dust and fine stones into their eyes.

Much interest is being taken by local automobilists in the construction of the automobile driveway from the city to Sewickley Heights, where are located the magnificent home of the Allegheny Country Club and the summer residences of many of Pittsburg's millionaires. The road will lead out from the city by the Perrysville pike road and thence will run through a series of hills and gullys to the Mount Nebo road and thence by the pikes over the Heights to the clubhouse and down to Sewickley proper. Several deep cuts are being made and the road when completed will afford the most picturesque driveway to be found around Pittsburg.

Bids are being taken for the macadamizing of the road from Hulton station on the Allegheny river to the Unity and Milltown road, a distance of four miles. The road will run by the handsome grounds of the Oakmont Country Club and will afford a direct connection with the Flinn macadamized roads running out from the city. Its advantage to automobilists will be in the fact that the Allegheny river in the vicinity of Oakmont not only affords the most beautiful scenery in Allegheny county, but also furnishes splendid boating and bathing facilities near the Oakmont Club property.

## SEPTEMBER FETE AT GRAFTON, MASS.

The Grafton Country Club, of Grafton, Mass., will hold an automobile fete September 22. All the hunt and other clubs of Massachusetts and many of Rhode Island have been invited to make the preserves of the club in North Grafton their headquarters during the games. The fete last year was held jointly by the Worcester Automobile Club and the Grafton Automobile Club. The former club announced recently that it will conduct games in August, while the Grafton club now announces that it will hold a fete all of its very own in September.

# LETTERS INTERESTING AND INSTRUCTIVE

## A Word For and About the Chauffeur.

Editor THE AUTOMOBILE:

[346.]—There is much unfavorable and unjust criticism, as well as much that is well merited, concerning the chauffeur. After having operated a car for four seasons in Boston and New York and toured in Massachusetts, New York and Pennsylvania, I have found that the trouble is largely due to the operator himself. During this time I have been able to avoid accidents, and have been arrested twice for exceeding the speed limit. In both instances I was going at less than twenty miles an hour.

One case was admitted to be on account of spite of a "gentleman" who did not own a car and was the prime mover in a crusade against all who did. The other case was largely due to a mistake on my part, as it was my first trip in that locality, and I did not know that I was in one of the public parks, but later, while driving for a private party in that locality, I was allowed to drive at that same speed, and was informed by one of the officers that when a man was known to be a cereful driver he was allowed a certain amount of leeway, for which I thanked him, and if an extra officer was put on in any locality I was informed beforehand to look out for him until he got "domesticated."

I have found that in the main an operator will have but little trouble if he respects the rights of the public. One very fertile cause of trouble is due to the makers of the cars themselvs. They advertise a car "that any one can drive," which very doubtful advice is carried out to the letter to the detriment of the public safety and automobiling as well. Likewise to the man who is competent to operate a car.

It would surprise many people to know how many there are driving automobiles to-day who should be driving other vehicles, or, better yet, "pushing" still others; whose knowledge is confined largely to steering a car with more or less certainty, and whose "salary" is often "steen" a week or less, and who can "operate" a car, provided they do not meet with any trouble to speak of. I have seen a few; here are two samples.

A party in Boston who purchased a car "broke in" his coachman to drive it. The agency very soon got word that the car was stalled outside the city, with the request that a man be sent out at once to help them out of their trouble. It fell to my lot to go, and on arriving at the seat of war I found "the operator" at work? Oh yes, in the seat. It took an hour to get there, and five minutes to start the car, the trouble being with the carbureter, the location of which, if I remember rightly, he did not even know. Then they got a boy of less than fifteen years to "operate" the car. He was there but a few days when he took a notion that he would like to take a trip "all by his lonesome," which led him to the repair shop by way of a street car. After which novel experience he did not think it worth while to come back to take his clothes.

Another one, a trifle better, put up beside me at one of the seashore resorts near Boston. He was getting "eighteen per" and might have done well, but he had the peculiar idea that the car belonged to him when his employer was not using it. He ruined two front tires in less than three weeks, simply because he did not know how to line up his front wheels, and you could track him by the smoke from his motor. He took the car out quite often for his own pleasure, until one night his employer wanted the car when he was out, and caught him coming home with it. Then "there was a show for another chauffeur," but previous to this he had killed a horse and ran into an ice wagon.

No person under eighteen years of age should be allowed to operate a car, nor any one not having had some mechanical experience,—also "others." There are enough good men to be had at fair wages, and why owners and manufacturers of cars costing some thousands of dollars will employ men who are not thoroughly competent to handle their cars cannot be explained in a satisfactory manner.

FRED BROWN.

Westover, Pa., July 21.

## Effect of Moral Example Bound to be Felt.

Editor THE AUTOMOBILE:

[347.]—I have received THE AUTOMOBILE of July 12, page 55, which includes an extract from an interview upon the subject of "Reckless Chauffeurs, Etc." I thank you for giving publicity to this matter, as I believe the entire automobile fraternity is interested in eliminating the reckless chauffeur.

Moral example has more effect than the law, and it will be a grand thing if the trade papers will hammer away upon this very important feature in which all of us are more or less interested.

E. R. THOMAS.

Buffalo, N. Y., July 19.

## Expansion in Internal Combustion Motors.

Editor THE AUTOMOBILE:

[348.]—Having read "C. F. J.'s" query regarding terminal pressures and the elimination of mufflers in your issue of July 12, I thought I might be able to throw some additional light on the subject. We can obtain the advantage of greater expansion of a given charge, and most of the other advantages of the special forms of expansion engine, by using an engine of somewhat greater capacity than would ordinarily be required, designed with a rather small clearance space but otherwise on ordinary lines, and running it well throttled down.

This is practically what is done with a certain make of motorcycle which I have ridden a good deal. The machine is fitted with a muffler cut-out which can readily be opened or closed while riding. I find when riding along a good level road, with the motor well throttled but with the spark well advanced, that upon opening the muffler cut-out I notice no increase in the noise of the exhaust, nor, on the other hand, do I notice any increase in speed. This proves to my mind, that under these circumstances of expansive working, that while the muffler does no good, it also does no harm, so it is just as well to let it remain on the machine. This method of securing greater expansion of the charge with an engine of the ordinary type has the advantage over the specially-designed expansion engine that we may, in case of necessity, utilize the entire capacity of our engine as in starting, hill climbing, etc. However, if this form of motor is designed to get the best results from the expansion of the charge, it will be found that, when running at its full capacity, the compression will be somewhat excessive and that the motor will show signs of overheating, if run on full throttle for very long. Under these circumstances, of course, a muffler would be found quite desirable at times.

I believe, however, that the reason that automobile builders have not given more attention to special forms of expansion engines is owing to the fact that they regard low weight per horsepower of the greatest importance and fuel economy of secondary consideration.

HAROLD H. BROWN.

Boston, July 23.

## Graphite as a Cylinder Lubricant.

Editor THE AUTOMOBILE:

[349.]—We do not recall having ever found anything in THE AUTOMOBILE to which we could possibly take exception, but in the issue of July 19, page 75, Professor Jones, in his "Catechism of the Gasoline Automobile," intimates that graphite should never be used in engine cylinders, as graphite is a solid matter, and causes the pistons to bind and heat the cylinder. The professor also states that a greese containing a solid matter should not be used for ball bearings.

As graphite is a solid matter, this, of course, according to the professor, should bar out the use of graphite for either engine cylinders or ball bearings. As a matter of fact, demonstrated time and again, and which can be demonstrated by Professor Jones, Dixon's Graphitoleo, which contains graphite, is used for both roller and ball bearings with marked improvement over any grease without graphite.

Furthermore, a proper proportion of Dixon's Flake Graphite No. 635, when used with oil for lubricating engine cylinders, will not cause pistons to bind, and, on the contrary, will prevent the piston from seizing when otherwise it would when overheated. Furthermore, the graphite will improve compression and every way improve lubrication. This has been tested thoroughly and is known to automobile manufacturers as well as to automobile users.

The manufacturers of the Franklin machine in their advertisements make a definite statement, that because of the auxiliary valve in the Franklin engine, graphite may be used for cylinder lubrication. Graphite is especially useful for lubricating cylinders of air-cooled engines, as graphite is vastly superior to oil as a conductor of heat, and its proper use in an air-cooled cylinder lessens the need of large quantities of oil, and, as above stated, makes better compression and less liability to overheating and seizing.

Yours very truly,

JOSEPH DIXON CRUCIBLE CO.

Jersey City, N. J., July 20.

**English fruit growers** have made the statement that the dust of the road, raised by automobiles and carried by the wind into the orchards, kills insects that would otherwise harm the fruit trees. Too much dust, however, injures the trees.

## HOW PERRYSBURG TRAPPED SCORCHERS.

TOLEDO, O., July 23.—For originality in methods requiring the observance of the ten-mile speed limit regulation, the officials of Perrysburg, a small village two miles south of Toledo, certainly have the right to first place. By way of introduction it might be said that the village has just completed a long stretch of macadamized road which is the apple of its eye and which it is guarding with jealous care.

Now it happens that this stretch of road is also very popular with the several hundred automobilists of Toledo, for it is one of the finest bits of roadway outside the city of Toledo and at the same time forms a part of the unexcelled ride along the Maumee river, which is noted for its historic setting during the war of 1812. At all events the officials of the village have made numerous attempts to stop speeding on this roadway. The reason assigned for not wanting speeding is that automobiles running more than ten miles an hour throw the top dressing off the macadam, thereby seriously damaging the roadbed. There have also been several complaints of narrow escapes from serious accidents.

At all events the village officials decided to administer a large dose of wholesome experience and accordingly went about to fix as neat a trap as ever spider laid for fly. Along this roadway a half mile stretch was measured off and every automobilist going that way was given three minutes to cover that distance. If he covered it in less, biff went the springs of the trap and he was fast, a thing that happened no less than ten times Sunday, July 15.

At each end of this half mile stretch were stationed three men, one man to hold the telephone, a special system being set up between the two limits, one man to hold a stop watch, and the third to bag the game. Then as a sure means of stopping those who might be inclined to be pugnacious, an old-fashioned toll gate was fixed up out of a telephone pole, it being fastened at one end by a hinge and so arranged that when a spring was released, it flew across the roadway at lightning speed. It proved a barrier in the best sense of the word.

Then, to complete the trap, Mayor Bowers established a court at the busiest end of the stretch and as soon as a victim was caught he was promptly soaked $10 or $25 and costs and allowed to move on. Six separated themselves from their cash, while four furnished bail and have some idea of appearing for trial. It also happens that the majority of those who fell into the trap are among the prominent people of the city, only one being from elsewhere, and he from the Hoosier state.

Those who paid fines are: E. B. Yaryan, manager McClaren & Sprague Lumber Company; Franklin Jones, manager Acme Builders' Supply Company; H. R. Fowler, manager Fowler Electrical Company; John M. Cowan, manager M. I. S. T. Medical Company; H. F. Reynolds, Marion, Ind.; William Wilkie. Those who gave bail in the sum of $35 are as follows: A. E. Schaaf, general manager of the Pope Motor Car Company, who Monday pleaded guilty and paid a fine of $20 and costs; Burton O. Gamble, manager Toledo Motor Car Company, whose trial has not yet been held; Albert Neukom, owner of the largest stoneyard in Toledo, and William Bretch, prominent grocer.

## QUINN GETS BUSY ONCE MORE.

WORCESTER, MASS., July 23.—Chief of Police James Quinn, of Leicester, Mass., was ordered out last week to nab automobilists, by Chairman of Selectmen Channing Smith. Quinn and his trusties were only too anxious to get onto their jobs. The first victim of the season was A. B. Duke, of New York, son of the millionaire tobacco king. His big touring car, with a gasoline tank leaking badly, was held up on its way to Worcester, Friday afternoon. He was required to give $50 bonds, although at the time he had nothing but $100 bills. Instead of continuing to Boston, as he first stated he wished to, he returned towards Springfield for the purpose of warning several friends, with whom he returned some hours later, and who, thanks to his warning, were not caught in the trap. Duke appeared here in court on Saturday morning. Quinn testified as to the number of horses and children, and so forth, on the road where Duke's car was timed. Quinn said it covered an eighth of a mile in 19 1-2 seconds, which is at the rate of about 28 miles an hour. Duke was fined $15.

W. D. Flagg of Boston was nabbed and he handed over $15. George O. Loomis, a tester for the Pope Manufacturing Company, was taken into court and fined $15. Loomis was with a man who had just bought the car, but neither of them could furnish the required $50 bonds. Loomis' watch was held as security.

Quinn complains that street railway conductors and many small boys are handing out tips to automobilists, so that he is not catching his full share. The newspaper men are also tired of Quinn, and he is not getting any of the notoriety that was given him last year.

## TRADESMEN DENOUNCE SCORCHING.

PHILADELPHIA, July 23.—That the Association of Automobile Tradesmen, recently organized here, will do everything in its power to prevent a decadence of the sport by necessarily—or unnecessarily—drastic action on account of persistent violators of the speed ordinances in Philadelphia and adjacent counties was evidenced by the action taken at its meeting at the Hotel Majestic last Wednesday night. Among the most important business transacted at that meeting was the unanimous passage of the following resolutions:

**Whereas, The owners of automobiles have been deprived in many instances of the rights and liberties possessed by them in common with the general public and users of the highway, by the action of a few irresponsible and reckless operators of machines; and,**

**Whereas, It is to the interest of all auto owners, as well as the general public, that the laws and other regulations relating to the speed and management of automobiles should be fairly and strictly enforced; it is**

**Resolved, That we do hereby formally express our disapproval of the operation of automobiles to the inconvenience and danger of other users of the public highways; and it is further—**

**Resolved, That we co-operate with the authorities in their efforts to suppress and punish those reckless and incompetent operators of cars who habitually disregard all proper regulations; and do further**

**Resolve, That a committee be appointed to formulate a plan whereby the purposes generally expressed in the foregoing resolutions may be practically carried out and the abuses referred to remedied.**

After the meeting George H. Smith, president of the new association, stated that he would name the committee some time during the present week. Almost every car having headquarters in this city was represented at the meeting.

## ENFORCING THE ONTARIO LAW.

TORONTO, ONT., July 23.—The Ontario Government has appointed five special Provincial constables, whose sole duty for July, August and September will be to enforce the provisions of the amended act of last session to regulate the speed and operation of motor vehicles on highways. The appointees are: John Stanley, Toronto; Edward T. Van Nurrope, Ottawa; Robert Mackay, Fallowfield; William H. Kavanagh, Owensville, and Eleazer Feisby, Aurora.

All will be under the direction of the Assistant Provincial Secretary, who will send them from time to time to districts in which their services are most needed. Three thousand dollars was voted in the supplementary estimates, at the last session of the Legislature, for the enforcement of the act, which went into force July 1 last. Under the act the constables, or any officer of the peace, have wide powers as to the arrest of violators of the law.

**A California Superior Court judge** has rendered a decision to the effect that state laws regulating the use of automobiles do not hold good within city limits, and that if municipal authorities are to enforce ordinances made with a view to preventing the misuse of the highways by automobiles, such ordinances must be formulated by the municipal authorities. The decision has caused much comment.

## BUCKBOARDS IN R. F. D. TESTS.

WASHINGTON, D. C., July 23.—With a view to determining their practicability for rural free delivery service, the Post Office Department conducted some severe tests of two Orient buckboards from June 27 to July 3. The official reports on these tests are just now available and are of great interest. Following is an excerpt from the report of the Post Office representative who observed the tests:

"On repeated tests the buckboard got over the bad roads without difficulty, delay or disaster. Some of the points noted in its favor by the agent for the Department who made the trips were the absolute control of the machine by the operator, the precision with which it climbed and descended steep, rough and dangerous hills, and waded through mudholes, and the thorough protection afforded the mail during a heavy rain storm. Three routes which by ordinary horse conveyance took a little over seventeen hours to serve, were fully and satisfactorily covered by the motor cars in less than nine hours. The average cost of fuel consumed in operating these test machines was computed to be less than 1.1 cents a mile. The adaptability of motor transportation to rural service having thus received favorable demonstration, the question of its practicability as applied to all sections of the country remains a matter for consideration. The element of the original cost of the motor car is one which will have to be passed upon by the rural carriers themselves, as they are required to furnish their own mode of conveyance, which is included in their maximum annual salary of $720."

The buckboard tests were personally conducted by E. P. Chalfant, sales manager for the Waltham Manufacturing Company, and the Post Office Department was represented by William A. Barr, of the rural free delivery branch. Three routes were selected, as follows: From station at Benning, D. C., through District of Columbia and into Maryland and return, a distance of 24 3-8 miles; from Georgetown, D. C., across the Potomac river and through Alexandria and Fairfax counties, Va., 22 miles; and from Bethesda, Md., into a portion of Maryland, 26 miles. These routes presented many of the adverse conditions of rocky and corduroy road beds, steep grades and mud holes to be found in more remote communities. Two days were devoted to each route, the regular horse service schedule being maintained the first day to show that it could be done, and an effort being made the second day to show the saving in time that could be effected with the automobile.

## TRADE HAPPENINGS AT INDIANAPOLIS.

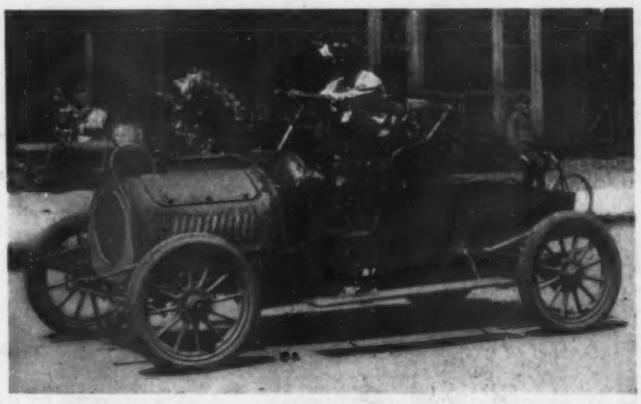
INDIANAPOLIS, IND., July 23.—Following negotiations with the Merchants and Manufacturers' Association of Knightstown, the Columbia Electric Manufacturing Company has decided to remove its factory from McCordsville to Knightstown. The automobile company offered to move to Knightstown on condition that a building should be erected for it and that it should have the use of it free as long as the factory was kept in operation. After several public meetings money for the erection of the factory was subscribed and twenty lots donated by the Merchants and Manufacturers' Association. Work on the new factory begins this week, and it is expected that it will be ready for occupancy by September 1. About seventy-five men will be employed in it and at least 300 completed automobiles will be turned out in 1907.

The Columbia Electric Manufacturing Company manufactures gasoline automobiles and telephones. When the company moves into its new factory the name of the concern will be changed to a name more in keeping with its business. It is probable the name will be changed to the Leader Automobile Company, after the name of the line made by the company.

It is announced that the Central Garage on East Market street has discontinued business. The agencies for the Chicago Steamer and Reliance cars carried by the company have not yet been replaced.

## TELEPHONE CO. TESTS PREMIER CARS.

An interesting test of an air-cooled car took place recently when the Long Distance Telephone Company, of Indianapolis, Ind., received an emergency call from Phoneton, 124 miles distant, at a time when it was too late to catch a train that would reach that place within a reasonable time. The Premier Motor Manufacturing Company was asked if one of its cars could be



PREMIER TEST CAR USED BY TELEPHONE COMPANY.

used, and if Phoneton could be reached in better time than by waiting for the next train or by taking an electric car. A test car was promptly furnished, driven by a tester, and the trip made without a stop and without mechanical difficulties of any kind. The telephone company's representative arrived at his destination several hours sooner than if he had waited for the next train, and had a pleasant ride into the bargain. The telephone company has frequently used the Premier test cars on short runs of the same nature, but this was the longest trip undertaken.

## MR. HAVEMEYER'S NEW CAR.

A good idea of the attractive appearance of the 15-20-horsepower Locomobile touring car of the 1906 model is given by the accompanying photograph of one of these machines owned by J. P. Havemeyer, of New York. Mr. Havemeyer is at the wheel

J. P. HAVEMEYER AT WHEEL OF HIS NEW LOCOMOBILE.

and beside him is Irene Davis, the little daughter of S. T. Davis, president of the Locomobile Company of America; Mr. Davis himself is in the rear seat, beside Mrs. Havemeyer.

## GERMAN INTERNATIONAL AUTO SHOW.

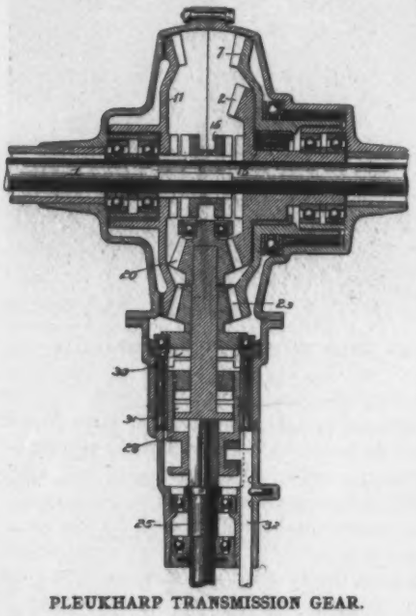
The forthcoming show in Berlin takes place November 1-16, this time in the huge new exhibition hall near the Zoological Garden, which is nearing completion. The Duke of Ratibor is at the head of the committee.

# Patents

### Speed Changing Device.

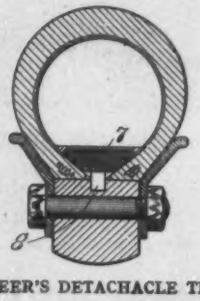
No. 824,811.—I. H. Pleukharp, of Columbus, Ohio.

This is a transmission by bevel gears to a live axle, two forward speeds and one reverse being obtained by using gears of



PLEUKHARP TRANSMISSION GEAR.

different sizes. The gears are in constant mesh, and claw clutches are employed to connect them with their shafts. The differential gear is not shown. In the drawing *1* is the axle shaft, which is driven by bevel gears *2* and *11*, through the clutch *15*. These gears, and also the low-speed gear *7*, engage pinions *20 23*, of which the latter is loose on the shaft carrying the former. The driving shaft *25* has a squared end carrying a sliding clutch member *28*, which is shifted by rod *32* to engage clutch member *30* or *31*, driving *23* or *20* respectively. The drive from *23* is through *7*, and the roller tooth ratchet *18* to the hub of *2*. When the high-speed pinion *20* is driving the ratchet overruns.



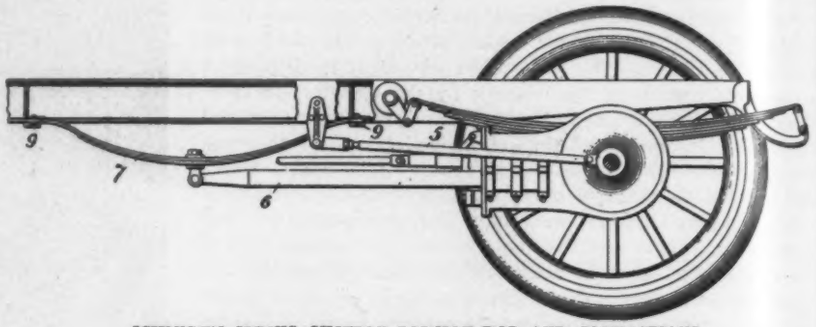
GREER'S DETACHACLE TIRE.

### Detachable Tire.

No. 822,241.—W. E. Greer, of Akron, O.

A tire whose shoe is held from creeping without beads or lugs by an endless ring *7*, of the section shown and of tough material. A suitable number of notches are cut in it to receive rectangular pieces *8*, which are inserted in the rim and project sufficiently to engage the notches in *7*. The air pressure forces *7* against the edges of the shoe and grips the latter sufficiently to prevent creeping.

The clutch shown in this patent is of the metal-to-metal variety having grooved faces to increase the rubbing surface. The driving shaft *1* carries the clutch drum *4*, and the shoes *8 8* are pivoted on a spider *17*, whose hub *15* is keyed to the driven shaft *9*. The shoes are expanded against the drum by the right- and left-hand screw



SCHMIDT'S SPRING CUSHION TORSION ROD AND CONNECTIONS.

### Detail of Running Gear.

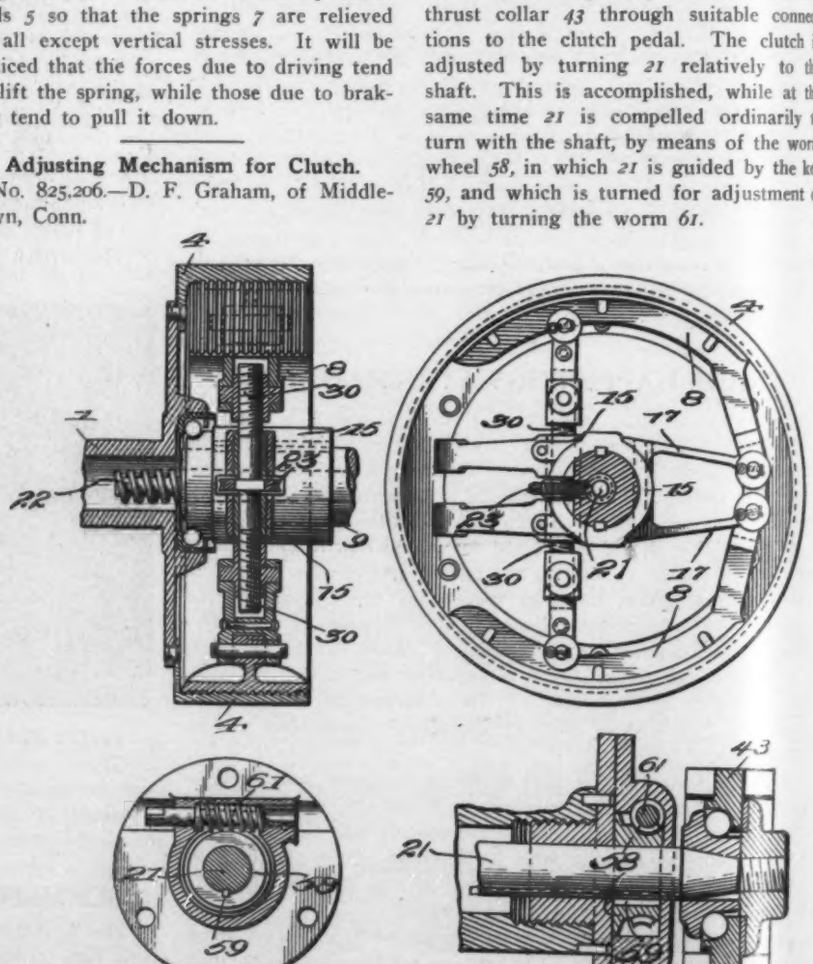
No. 824,747.—C. Schmidt, of Detroit, Mich.

This invention covers a spring cushion *7* for the torsion rod *6* of a live axle of the Packard type. The spring is semi-elliptical, with flattened ends sliding freely in guides *9 9*. The axle is located by radius rods *5* so that the springs *7* are relieved of all except vertical stresses. It will be noticed that the forces due to driving tend to lift the spring, while those due to braking tend to pull it down.

### Adjusting Mechanism for Clutch.

No. 825,206.—D. F. Graham, of Middletown, Conn.

*30*, which is rotated by the spiral-toothed pinion *23*, engaging the threaded rod *21 22*. This rod shifts lengthwise in the shaft *9* and performs the functions of a rack. A helical compression spring, not shown, holds *21 22* normally in the position corresponding to clutch engagement, and the clutch is released by shifting *21* by means of the ball-thrust collar *43* through suitable connections to the clutch pedal. The clutch is adjusted by turning *21* relatively to the shaft. This is accomplished, while at the same time *21* is compelled ordinarily to turn with the shaft, by means of the worm wheel *58*, in which *21* is guided by the key *59*, and which is turned for adjustment of *21* by turning the worm *61*.



GRAHAM'S ADJUSTING DEVICE FOR AUTOMOBILE CLUTCHES.

# NEWS AND TRADE MISCELLANY.

Barney Oldfield has renewed his contract with the Peerless Motor Car Company, of Cleveland, and will drive the old *Green Dragon* for the balance of 1906, instead of terminating his engagement from July 1.

The Auto-Car Equipment Company, of Buffalo, N. Y., recently shipped to Sofia, Bulgaria, a 16-passenger gasoline brake, with canopy top. This was the initial car of a transportation line about to be started in that city.

The police departments of Richmond, Va., and of Columbus, O., have adopted the Jones speedometer for checking the speed of automobiles. Motorcycle policemen will thus be in a position to know just how fast automobilists are going.

A cyclone recently tore the roof off the Stamford Motor Works, of Stamford, Conn., and deposited it, with the shafting, hangers, and so on, fifty feet away. Eight men escaped injury by diving under a bench that was protected by a brick wall.

The Hartford Suspension Company, of New York, desiring to verify its claim that 95 per cent. of all shock absorbers used were of Hartford make, recently made a canvass, and ascertained, according to its report, that actually 92 per cent. of the cars equipped with shock absorbers had Hartfords.

Work has been commenced on a large addition to the plant of the Mitchell Motor Car Company, of Racine, Wis., a machine shop 240 feet long, of steel and concrete. The new building will be novel, in that there will be no windows in the side walls, all light coming through very large skylights in the roof.

The Diezemann Shock Absorber Company, of Hoboken, N. J., reports that a number of Glidden tourists have equipped their cars with Diezemann devices since discovering the condition of the roads and the frequency with which springs were broken, and that the results obtained have been extremely satisfactory.

The Acme Motor Car Company, of Reading, Pa., has gone into the hands of a receiver, Daniel J. Driscoll having taken charge of its affairs. Frank A. Devlin, a heavy creditor, filed the petition. It is understood that the receivership will be only a temporary matter, pending a readjustment of the company's finances.

The Grand Duke Michael, of Russia, has purchased a 60-horsepower Brasier car with a special body fitted up with two reclining chairs, convertible into a bed, and with a chest of drawers, desk and other conveniences for traveling. The body is finished inside in natural mahogany and is lighted by incandescent electric lights.

The Packard Motor Car Company, of Detroit, Mich., reports that R. D. Evans, of Boston, who, with a party of friends, is touring in Europe with a Packard car, has discovered a French road which had never been traversed by an automobile before, as far as could be discovered, the peasants along the route being intensely interested by the car.

An advertisement for Jackson motor cars, which appears entirely unobjectionable to the ordinary reader, was recently submitted to the Middlebury, Vt., *Register*. The publisher of that paper, an ardent hater of automobiles and everything pertaining thereunto, replied that he did not accept automobile or liquor advertising at any price.

The G & J Tire Company, of Indianapolis, Ind., has issued an exceedingly attractive poster in colors, representing an automobile and a big four-in-hand making a noon stop at a quaint, old-fashioned wayside inn. It is significant that mine host is "washing his hands with invisible soap" before the automobile, while one of his men runs to the coach.

S. F. Bowser & Co., of Fort Wayne, Ind., are building a Canadian branch factory in Toronto, to be completed in about a month's time. The company have been very successful in introducing their tanks in Canada; in fact, have made installations in practically all the garages. Their new factory will be a two-story brick building, 50x125 feet, with the office and machine shop on the first floor, and the finishing department on the second floor. The factory will be run with electric power.

The Williams Motor Car Company, of Akron, O., was organized July 16, with the following officers: President, J. F. Townsend; vice-president and general manager, H. A. Williams; treasurer, Henry Robinson; secretary, L. D. Slusser, all of Akron. Frank G. Fries, of Buffalo, has been engaged as superintendent of the new plant the company expects to establish by December 1 in East Akron. Three styles of pleasure cars will be built—a $750 runabout, a $3,500 and a $5,000 touring car—all embodying inventions of H. A. Williams. Plans are being made to build commercial cars.

Rowan Ray, of Carrolton, is in Kansas City making arrangements for the manufacture of a four-wheel-drive automobile, patented by Dr. G. W. Smith, of Lexington Junction, Mo. The car is driven by 3-horsepower Holley motor, which transmits the power through planetary gears to a short drive shaft, the latter carrying a small spur gear on the rear end. This gear meshes with a larger gear on a shaft extending from front to rear axle and driving both front and rear wheels through a differential on each axle. The rear differential is fitted in the ordinary way, while in front, owing to the fact that, in steering, the front wheels are moved as in a buggy—that is, with a solid axle—the long shaft drives a pinion on a vertical shaft and this in turn drives the front differential, the wheels being moved as on the rear axle. The frame is mounted on large buggy wheels fitted with solid tires.

Summons and complaint have been served in an action brought by Albert H. Sours, secretary and general manager of the McKinley Motor Car Company, of Rochester, N. Y., against Stanley R. Snook, president of the company, charging him with misappropriating to his own use $3,300 of the firm's money and an automobile. All officers and directors of the company are made parties in the action for an accounting. Papers have also been filed asking for the appointment of a receiver and an injunction restraining Snook from destroying the rights and assets of the company. The company was incorporated November 22, 1905, with a capital of $20,000, of which $8,400 was paid in stock. Mr. Sours was the promoter, turning over to the company his prospective business. The stockholders were Elwood H. Lapp, Mr. Snook and Frederick E. McClellan. The Company is said to be in debt for $5,000 with assets consisting of $200 in cash and three second-hand cars valued at $3,000. The motion will be heard in Special Term of Supreme Court, July 30th.

## NEW AGENCIES ESTABLISHED.

Arrangements have been made by C. J. Farrar, of Crafton, Pa., whereby he will have the agency for the sale of Pope-Tribune motor cars in the Pittsburgh territory.

The Auto Maintenance Company, 1141 South Broad street, Philadelphia, has secured the agency for the Riviera car for Philadelphia, Southern New Jersey and Delaware. This car is built at Lebanon, Pa.

H. A. Conners, who recently opened new salesrooms at 262 North Broad street, Philadelphia, has announced that hereafter he will represent Smith & Mabley, Inc., in the Quaker City, his line consisting of Simplex, Panhard, Renault and Mercedes cars.

The Auto Cover and Top Manufacturing Company, Inc., of 154 East Fifty-seventh street, New York, has taken the Greater New York agency for the Harroun auto bumpers, which are designed to protect the front part of the car and the lamps in case of collision.

The New York and Brooklyn Automobile Supply Company will open a supply house at 1693 Broadway, New York, near Fifty-third street, and will supply the jobbing and wholesale trade, as well as retailing. The new place will open about August 1, and will be under the management of David E. Hydecker. A specialty will be made of automobile clothing.

The latest company to go into the automobile business in Pittsburg, Pa., is the Schenley Automobile Company, its members being Thomas S. Booth and L. J. Sixt. They have located at 3994 Forbes street (L. G. Martin's old garage). Mr. Martin will, however, conduct his automobile business as heretofore at his new garage, 3923 Forbes street. The Schenley Automobile Company expects to have the best of storage and repair facilities, and, in addition to carrying a full line of supplies, will also represent several automobile manufacturers a little later.

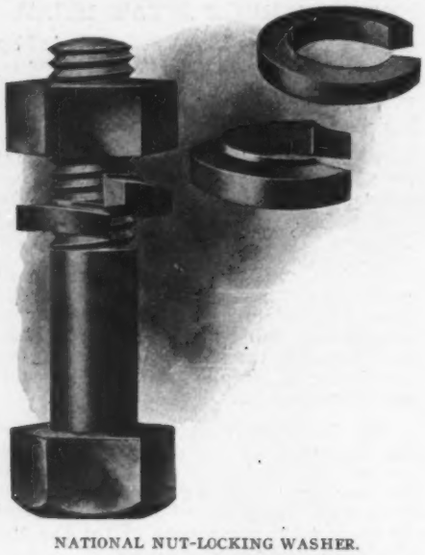
## PERSONAL TRADE MENTION.

The Colonial Automobile Company, Pittsburg, Pa., has secured the services of Jos. T. Murray, who was for a short time connected with the Michelin Tire Company's Pittsburg agency. Mr. Murray's duties will be those of salesman and demonstrator, looking mainly after sales of cars manufactured by the Cleveland Motor Car Company.

George C. Johns has severed his connection with the Moon Motor Car Company, and has accepted the acting sales managership of the Kobusch Automobile Company, of St. Louis, Mo., manufacturing the American Mors car. Mr. Johns will start East from St. Louis early in August, driving a 24-32-horsepower car to Boston and New York.

# INFORMATION FOR BUYERS.

LOCK WASHERS.—Every automobilist knows the importance of having the nuts stay on the bolts until they are purposely taken off, and many know the disastrous results that not infrequently follow the working out of a bolt whose nut has come off because of the lack of some locking device. The National Lock Washer Company, of 65 Johnson street, Newark, N. J., manufactures lock washers in all sizes, and these are particularly convenient for automobile use. As the illustration shows, the National lock washer is a simple steel washer split and the ends turned in opposite directions. The steel of which the washers are made is very springy, and when the nut is screwed down on top of it, the sharp edges of the split are forced into the face of the nut on one side and of the surface under the nut on the other side, and turning back is prevented. The washer acts as a sort of ratchet detent, making its own notch by digging into the metal. If the automobilist carries in his kit a box of lock washers to fit the various bolts on his car, the many nuts that may come loose can be tightened down again with a lock washer and trusted to "stay put."



NATIONAL NUT-LOCKING WASHER.

PROTECTION FOR TIRES.—A ready means for protecting a worn or badly damaged spot in a tire is often required by the automobilist, and a device intended to fill this need is manufactured by the Adwear Auto Tire Sleeve Company, of North Attleboro, Mass., under the name of the Adwear tire sleeve. This consists of a sleeve of chrome-tanned leather, shaped to fit snugly over a section of the tire and long enough to cover ten or twelve inches of it. Hooks are provided by which the sleeve can be laced in place, the lacing passing over the rim between the spokes. When a blow-out occurs, or any other damage weakening the tire in one place, the sleeve is laced on and left there until a permanent repair can be made. The leather is thick but pliable, and the manufacturers state that the peculiar tanning process to which it is subjected prevents its hardening after being wet, and that it is entirely waterproof. Various sizes and styles are made for different tires.

MOTOR EXCHANGE.—A novelty, in a way, is the catalogue issued by the Gasoline Engine Exchange, of 842 South Eighteenth street, St. Louis, Mo. This concern makes a specialty of gasoline engines for automobiles and motor boats, buying and selling all kinds, both new and second-hand. The company claims to have on hand the largest assortment in America of motors, they running from 1 to 50 horsepower and having from one to six cylinders—air-cooled, water-cooled, vertical, horizontal. All second-hand motors are tested in the shops and their condition ascertained exactly. The catalogue describes and illustrates the line of new motors, and also a variety of fittings for marine motors, ignition apparatus, carbureters, mufflers, pumps and radiators. The second-hand motor idea would seem to be a good one, offering opportunities for obtaining good motors at reasonable prices for experimental and other work.

AUTOMOBILE BODIES.—A specialty is made of automobile parts and components by H. F. Borbein & Co., of 2111 North Ninth street, St. Louis, Mo., this concern being prepared to supply everything wherewith to build—or rather assemble—a complete car; they do not, however, build complete cars, but can furnish every part finished from a bolt to a four-cylinder motor and the body. bodies are made in many sizes and styles, and the accompanying illustrations show two recent models. The King body, listed as No. 21, has wide, deep side doors with polished brass hinges and handles. The length of the body at the bottom is 92 inches and the width 36 inches; the rear seat measures 60 inches across the top. A door is placed in front of each seat, giving access to the space underneath. A dash, of wood, can be supplied if desired, and the standard dimensions can be altered on order. The Queen body, No. 22, is of the same overall dimensions as the King body, but the outlines are somewhat different, as the illustrations show. Doors are regularly hinged at the front, but can be hinged at the rear if desired. Both bodies are said by the manufacturers to be exceedingly handsome in design and thoroughly well made. The Borbein bodies are always furnished in the white or with one coat of lead, and may be had either with or without the seats upholstered. In addition to these two models the company builds bodies for runabouts, surreys, touring cars, commercial vehicles—in fact, practically every type of automobile body can be had in the white.

BORBEIN'S KING MODEL AUTOMOBILE BODY.

LARGE VULCANIZERS.—A large vulcanizer for handling from five to eight automobile tires simultaneously is manufactured by Charles E. Miller, of Anderson, Ind., and is of the type used in the open steam cure process. A special vulcanizer for inner tubes is made, the surfaces being smoothly planed and a hole provided for valve stems.

NEW NORTHERN CATALOGUE.—A new catalogue of a particularly interesting nature has been issued by the Northern Motor Car Company, of Detroit, Mich., describing the Northern cars, from the well-known single-cylinder runabout to the latest model, the four-cylinder 30-horsepower touring car. This is the machine that is fitted with an air-operated main clutch and air brakes. A feature of the catalogue is the manner in which the working parts of some of the cars are illustrated. Cylinders, transmission gears, and other components, are shown partly in section, in such a way that their arrangement and operation are made clear. The press-work on the catalogue is excellent.

QUEEN MODEL AUTOMOBILE MADE BY BORBEIN COMPANY.